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ABSTRACT

Examined are the educational and employment characteristics of scientists and engineers who graduated during the years 1972, 1974, 1975, and 1976, with special attention to those whose work involves energy. The characteristics of energy-related graduates to those of more experienced scientists and engineers involved in energy activities are compared. Presented for the first time are tabulations on employment involving specific energy sources and activities. Other characteristics discussed include educational level, salary, primary work activity, type of employer, and the proportion of graduates who found employment in their major fields. Data are from the 1976 and 1978 National Surveys of Recent Science and Engineering Graduates, and the 1976 National Survey of Natural and Social Scientists and Engineers, sponsored by the National Science Foundation and the U.S. Department of Energy. (Author/WB)

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ENERGY-RELATED SCIENTISTS AND ENGINEERS:

A Statistical Profile of Recent Entrants into the Work Force, 1978

By
Sharon E. Bell

December 1979

Work Performed Under Contract No. EY-76-C-05-0033

Division of Labor Affairs and Manpower Assessment
Office of Education, Business and Labor Affairs
United States Department of Energy

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ENERGY-RELATED SCIENTISTS AND ENGINEERS:

A Statistical Profile of Recent Entrants into the Work Force, 1978

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FOREWORD

This report examines the educational and employment characteristics of scientists and engineers who graduated during the years 1972, 1974, 1975, and 1976, with special attention to those whose work involves energy. The characteristics of energy-related graduates are also compared to those of more experienced scientists and engineers involved in energy activities. Information is based on the results of the 1976 and 1978 *National Surveys of Recent Science and Engineering Graduates*, and the *1976 National Survey of Natural and Social Scientists and Engineers*, sponsored by the National Science Foundation and the U.S. Department of Energy.

Tabulations are included for the first time on employment involving specific energy sources and activities. Other characteristics discussed include educational level, salary, primary work activity, type of employer, and the proportion of graduates who found employment in their major field.

Norman Seltzer, Chief
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Labor Affairs

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INTRODUCTION

In recent years, national attention has increasingly focused on energy--where to get it and how best to use it. Current concerns include developing new supplies of conventional energy, developing alternative sources of energy, and conserving the energy supplies now available. The need for people with appropriate skills to perform the tasks associated with these problem areas has drawn attention to education, training, and employment in energy-related activities. This report examines the characteristics of scientists and engineers who graduated during the years 1972, 1974, 1975, and 1976, with special attention to those whose work involves energy. The information is based on the results of the 1976 and 1978 *National Survey of Recent Science and Engineering Graduates*, sponsored by the National Science Foundation (NSF). The 1978 survey, for the first time, included questions on employment in specific types of energy fields and activities. The sample size was also enlarged in the second survey to include more energy-related graduates. Funds for these changes were provided by the Division of Labor Affairs and Manpower Assessment, the United States Department of Energy (DOE).

DATA DESCRIPTION

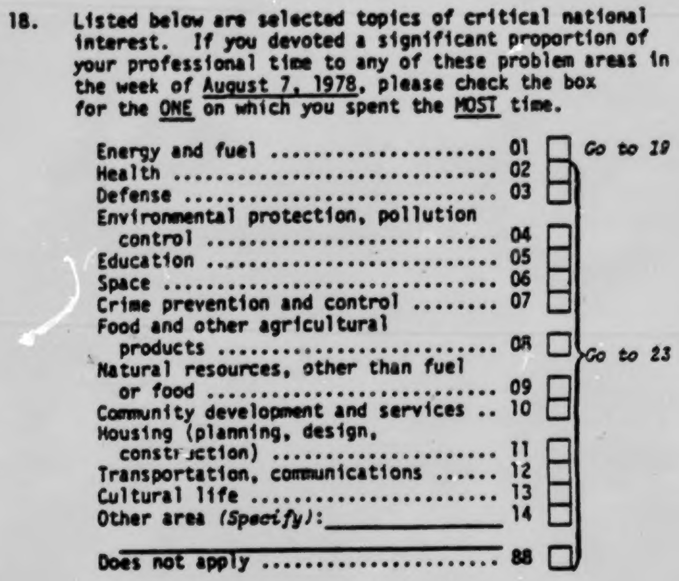
The first two sections of this report present data from the *1978 National Survey of Recent Science and Engineering Graduates*, conducted by Westat, Inc. for the National Science Foundation and the U.S. Department of Energy. Westat surveyed 14,439 science and engineering graduates; 6,529 earned a bachelor's or master's degree between July 1, 1971 and June 30, 1972 (1972 graduates); and 7,910 received a bachelor's or master's degree between July 1, 1975 and June 30, 1976 (1976 graduates). Responses from these individuals were weighted to represent a total of 376,000 1972 graduates, and 377,000 1976 graduates. A copy of the questionnaire can be found in Appendix B.

The third section of this report compares the results of the 1976 and 1978 *National Survey of Recent Science and Engineering Graduates*. The shorter 1976 survey included 9,812 persons who received a bachelor's or master's degree in science or engineering between July 1, 1973 and June 30, 1975.[1] Appendix C contains a copy of this questionnaire.

Data from the *1976 National Survey of Natural Social Scientists and Engineers* (Appendix D), conducted for NSF by the Bureau of the Census, are compared with the recent graduates survey data in a fourth section.[2] The sample for this survey was drawn from persons who were identified as scientists and engineers in the work force during the 1970 Census of Population. Although there are differences between this and the Westat surveys,[3] some of the results can be compared.

DEFINING ENERGY-RELATED SCIENTISTS AND ENGINEERS

One of the questions in the 1978 Westat surveys asked respondents to check the area of critical national interest (if any) to which they devoted a significant proportion of professional time. The question is reproduced in Figure 1. Those who answered this question by checking "energy and fuel" are considered here to be energy-related. Note that the question allows only one choice. Persons working on the environmental or health effects of energy use may have chosen "health" or "environmental protection, pollution control" instead of "energy and fuel." Persons who selected "energy and fuel" may be considered a core group of energy-related workers; the total number of persons whose work involves some aspect of energy is probably much larger.



18. Listed below are selected topics of critical national interest. If you devoted a significant proportion of your professional time to any of these problem areas in the week of August 7, 1978, please check the box for the ONE on which you spent the MOST time.

Energy and fuel	**01**	☐	*Go to 19*
Health	**02**	☐	*Go to 23*
Defense	**03**	☐	
Environmental protection, pollution control	**04**	☐	
Education	**05**	☐	
Space	**06**	☐	
Crime prevention and control	**07**	☐	
Food and other agricultural products	**08**	☐	
Natural resources, other than fuel or food	**09**	☐	
Community development and services ..	**10**	☐	
Housing (planning, design, construction)	**11**	☐	
Transportation, communications	**12**	☐	
Cultural life	**13**	☐	
Other area *(Specify)*:_______________	**14**	☐	
Does not apply	**88**	☐	

Figure 1. Question Used to Identify Energy-Related Scientists and Engineers

The question used in the *1976 National Survey of Natural and Social Scientists and Engineers* differed slightly from the question in Figure 1. The Census question did not require that the choice be based on a specific reference week and did not include the choices of "transportation" or "other." Consequently, one would expect a slightly higher proportion of respondents to be represented in each category of the Census survey than in the Westat survey. The reader should remember this when comparing results from the two surveys.

The question in the 1976 Westat survey also differed slightly from that of 1978. ("Cultural life" was not a choice in 1976, and "education" represented two choices--"teaching" and "other" in that year.) However, these changes should not have made a significant difference in the number of graduates choosing "energy and fuel."

ENERGY-RELATED SCIENTISTS AND ENGINEERS

Recent graduates in science and engineering may be categorized either by employment specialty or by major field of study for the highest degree held. In general, information is given here for both major field of study and occupation, though where more appropriate, only one characterization is used.

Only 1.9 percent and 3.3 percent, respectively, of the 1972 and 1976 graduates indicated that they were unemployed and seeking work. Since the statistics for the employed respondents closely parallel those for the entire sample, the tables in this report represent only employed recent graduates.

MAJOR FIELD OF STUDY

Of the 336,000 employed 1972 graduates in engineering and science, about 7.0 percent indicated that they devoted a significant portion of their professional time to energy-related work during the reference week of August 7, 1978; approximately 8.3 percent of the 316,000 employed 1976 respondents indicated that their work was energy-related. A relatively high proportion of engineers (19.3 percent of the 1972 graduates and 22.1 percent of the 1976 graduates) were involved in energy-related activities. Only 4.0 percent and 5.0 percent, respectively, of the 1972 and 1976 graduates in science indicated energy-relatedness. However, both physical and environmental scientists were significantly involved in energy-related work (Tables 1 and 2).

OCCUPATION

The distribution of energy-related scientists and engineers by occupation is similar to the distribution of energy-related graduates by major field of study. The respondents were asked to define their occupations in terms of the field of their college major. One-third or more of those working in chemical or mechanical engineering and in environmental science, were also working on energy concerns (Tables 3 and 4). Since not all of those surveyed responded to the question on major field and the question on occupation, and since the large or fractional weights used can result in small errors, the totals given by major field of study and by occupation are slightly different.

ENERGY SOURCE

For the first time, energy-related respondents were asked to identify the energy source involved in the largest proportion of their energy-related work during the reference week. Tables 5 and 6 show that for both class years, the highest proportion of scientists and engineers listed petroleum as the major energy source, followed by nuclear sources. Of the 1972 graduates, a higher percentage of scientists (34.4 percent) than engineers (27.4 percent) were involved primarily in petroleum-related projects. In the 1976 sample, the same proportion of scientists as engineers worked on petroleum-related concerns (31 percent).

Tables 7 and 8 indicate that the distribution of work activities is similar for the fossil fuels (coal, petroleum, natural gas). Among 1972 graduates, a slightly higher proportion of those working on petroleum concerns are involved in development than are those working on coal or natural gas. The reverse is true of the proportion of petroleum-related workers in operations. Graduates of 1972 working with nuclear power are more likely to be involved in management activities than are their counterparts working with other energy areas. This is not the case for 1976 graduates.

ENERGY-RELATED ACTIVITY

Tables 9 and 10 indicate all energy-related activities in which the respondents were involved. Respondents were asked to check all activities in which they were involved, and the reader should note that in some cases, this involvement may be minor. Both engineers and scientists were involved in electric power generation, extraction, transportation, and environmental impact activities, though often more engineers than scientists worked in these areas. Engineers also indicated involvement in the manufacture, utilization, and conservation of energy. Scientists who graduated in 1976 also worked on energy utilization and conservation. More scientists than engineers participated in exploration activities (approximately 30 percent of scientists and 7 to 8 percent of engineers).

Tables 11 and 12 indicate the primary energy-related activities in which the respondents were engaged. Nearly 25 percent of the energy-related recent graduates were primarily involved with the extraction, manufacture, or processing of energy. Over 25 percent of the scientists were engaged in exploration activities, and a noticeable proportion of engineers worked on generation of electricity. Between the 1972 and 1976 graduating classes, involvement in energy conservation increased, mainly due to the increased participation of scientists in this area.

Environmental impact work was listed as a primary activity by only a few respondents. This is not surprising when one remembers that "environmental protection" was also a choice as an area of national concern. As mentioned earlier, it is likely that many persons working on the environmental effects of energy use selected "environmental protection" rather than "energy and fuel" as their area of work.

As Tables 13 and 14 indicate, the highest proportion of persons involved in exploring for energy viewed the major portion of their work as applied research. Most energy-related activities involved the respondents in management, design, or operations activities. Those working on environmental impact reported their major work activities as report and technical writing, basic research, and either consulting (1972 graduates) or quality control (1976 graduates).

Further information on energy-related scientists and engineers can be found in Appendix A, Tables A-1 through A-28.

Table 1. Major Field of Study for Highest Degree Held: Total Versus Energy-Related 1972 Graduates in 1978

Major	Total	Energy-Related	Percent Energy-Related
Engineering			
Chemical	4,540	1,450	31.9
Civil	9,060	1,390	15.3
Electrical or electronic	17,480	2,540	14.5
Mechanical	10,640	3,350	31.5
Nuclear, petroleum, or mining	2,450	1,610	65.7
Other	20,350	2,130	10.5
Total, engineering	64,520	12,470	19.3
Science			
Physical	16,040	1,740	10.8
Math and computer	27,210	1,370	5.0
Environmental	9,190	1,700	18.5
Life	46,050	1,760	3.8
Psychology and social	124,250	2,260	1.8
Total, science	222,740	8,830	4.0
Other	49,220	2,090	4.2
Total	336,480	23,390	7.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Totals for degree and for occupation may differ slightly since not all respondents answered both questions. Fractional weighting also results in small differences.

Table 2. Major Field of Study for Highest Degree Held: Total Versus Energy-Related 1976 Graduates in 1978

Major	Total	Energy-Related	Percent Energy-Related
Engineering			
Chemical	4,330	1,840	42.5
Civil	10,460	1,920	18.4
Electrical or electronic	14,470	2,040	14.1
Mechanical	9,300	3,230	34.7
Nuclear, petroleum, or mining	2,530	1,610	63.6
Other	20,210	2,900	14.3
Total, engineering	61,300	13,540	22.1
Science			
Physical	13,870	1,590	11.5
Math and computer	24,630	1,860	7.6
Environmental	9,240	2,270	24.6
Life	66,820	2,490	3.7
Psychology and social	129,090	4,000	3.1
Total, science	243,650	12,210	5.0
Other	10,960	370	3.4
Total	315,910	26,120	8.3

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Totals for degree and for occupation may differ slightly since not all respondents answered both questions. Fractional weighting also results in small differences.

Table 3. Occupation of 1972 Graduates: Total Versus Energy-Related Graduates in 1978

Occupation	Total	Energy-Related	Percent Energy-Related
Engineering			
Chemical	3,058	980	32.0
Civil	7,483	750	10.0
Electrical or electronic	13,953	1,920	13.8
Mechanical	8,550	3,420	40.0
Nuclear, petroleum, or mining	4,313	3,460	80.3
Other	22,801	3,460	15.2
Total, engineering	60,160	13,990	23.3
Science			
Physical	8,424	1,296	15.4
Math and computer	21,792	1,296	6.0
Environmental	5,014	1,666	33.3
Life	19,830	540	2.7
Psychology and social	25,078	627	2.5
Total, science	80,130	5,440	6.8
Other	194,460	3,880	2.0
Total	334,750	23,310	7.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Totals for degree and for occupation may differ slightly since not all respondents answered both questions. Fractional weighting also results in small differences.

Table 4. Occupation of 1976 Graduates: Total Versus Energy-Related Graduates in 1978

Occupation	Total	Energy-Related	Percent Energy-Related
Engineering			
Chemical	4,370	1,573	35.9
Civil	8,440	1,484	17.5
Electrical or electronic	13,096	1,892	14.4
Mechanical	10,177	3,820	37.5
Nuclear, petroleum, or mining	4,591	3,261	71.0
Other	20,618	2,992	14.5
Total, engineering	61,300	15,010	24.5
Science			
Physical	10,061	1,807	18.0
Math and computer	22,262	1,431	6.4
Environmental	5,792	1,968	34.0
Life	30,220	640	2.1
Psychology and social	27,773	1,203	4.3
Total, science	96,100	7,050	7.3
Other	156,150	4,050	2.6
Total	313,550	26,110	8.3

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Totals for degree and for occupation may differ slightly since not all respondents answered both questions. Fractional weighting also results in small differences.

Table 5. Major Energy Source Involved in Energy-Related Activities Versus Occupations of Energy-Related 1972 Graduates in 1978

Major Energy Source	Scientists and Engineers (Percent)	Engineers (Percent)	Scientists (Percent)
Coal and coal products	17.1	19.2	11.8
Petroleum[a]	29.4	27.4	34.4
Natural gas	11.6	11.2	12.5
Nuclear (fission and fusion)	20.7	22.8	15.5
Solar	8.0	5.5	14.5
Other	8.7	8.3	9.6
No answer	4.5	5.6	1.5
Total	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

[a] Includes oil shale and tar sands.

Table 6. Major Energy Source Involved in Energy-Related Activities Versus Occupations of Energy-Related 1976 Graduates in 1978

Major Energy Source	Scientists and Engineers (Percent)	Engineers (Percent)	Scientists (Percent)
Coal and coal products	15.3	16.2	13.3
Petroleum[a]	31.0	31.0	31.0
Natural gas	13.6	15.9	8.6
Nuclear (fission and fusion)	19.9	20.9	17.9
Solar	6.8	6.3	7.7
Other	7.6	6.4	10.3
No answer	5.7	3.2	11.1
Total	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

[a] Includes oil shale and tar sands.

Table 7. Primary Work Activity Versus Major Energy Source Involved in Energy-Related Activities: Energy-Related 1972 Graduates in 1978[a]

Work Activity	Energy Source Coal, Coal Products (Percent)	Petroleum (Percent)	Natural Gas (Percent)	Nuclear (Percent)	Solar (Percent)	Other (Percent)
Management	18.9	15.2	14.5	28.7	6.6	20.5
Teaching	1.9	1.3	0.0	2.5	14.1	0.0
Basic research	6.2	2.3	1.7	3.6	11.2	7.3
Applied research	7.7	7.4	1.7	13.7	11.7	5.6
Development	4.2	10.2	5.9	7.8	4.3	4.8
Report, technical writing	4.3	3.9	7.2	8.4	2.3	10.3
Design	13.5	9.4	7.4	9.3	12.2	8.8
Quality control	4.4	4.4	9.6	3.5	0.0	3.7
Operations	19.8	8.6	24.6	7.5	18.8	2.3
Distribution	3.7	7.6	10.9	1.7	0.0	4.2
Consulting	6.1	7.4	4.6	0.8	2.3	7.7
Other	9.3	22.3	12.0	12.6	16.5	24.7
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table 8. Primary Work Activity Versus Major Energy Source Involved in Energy-Related Activities: Energy-Related 1976 Graduates in 1978[a]

	Energy Source					
Work Activity	Coal, Coal Products (Percent)	Petroleum (Percent)	Natural Gas (Percent)	Nuclear (Percent)	Solar (Percent)	Other (Percent)
Management	14.2	18.6	10.9	9.5	11.6	11.8
Teaching	1.1	0.7	2.0	3.0	3.1	1.7
Basic research	9.4	4.2	0.7	7.0	16.0	12.0
Applied research	3.9	7.1	5.0	10.4	23.5	14.6
Development	6.1	7.5	4.8	6.8	11.0	7.2
Report, technical writing	8.3	4.4	4.3	10.0	6.1	5.5
Design	11.4	12.6	14.0	10.1	14.7	6.6
Quality control	6.3	4.7	7.3	8.7	6.2	10.1
Operations	19.4	16.9	22.8	13.1	2.4	1.9
Distribution	7.0	5.1	2.9	2.3	0.0	0.7
Consulting	4.8	3.3	1.1	10.6	4.4	4.4
Other	8.0	15.0	24.2	8.5	0.9	23.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table 9. All Energy-Related Activities Involved in Occupations of Energy-Related 1972 Graduates in 1978[a]

Activity	Scientists and Engineers (Percent)	Engineers (Percent)	Scientists (Percent)
Exploration	14.0	7.6	30.2
Extraction	13.0	14.2	10.0
Manufacturing	13.2	16.5	4.9
Fuel processing	8.7	9.8	6.0
Electric power generation	21.7	24.1	15.6
Transportation	14.4	16.3	9.8
Energy storage	5.7	6.6	3.1
Energy utilization, management	16.7	19.9	8.4
Fuel reprocessing or disposal	2.6	2.8	2.0
Conservation	13.3	15.6	7.4
Environmental impact	11.4	11.6	10.9
Education, training	5.0	3.1	9.8
Other	8.3	3.8	19.6

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

[a] Respondents were asked to check any activity in which they were involved. Many respondents checked more than one category.

Table 10. All Energy-Related Activities Involved in Occupations of Energy-Related 1976 Graduates in 1978[a]

Activity	Scientists and Engineers (Percent)	Engineers (Percent)	Scientists (Percent)
Exploration	15.3	8.4	30.1
Extraction	12.3	11.8	13.3
Manufacturing	12.9	15.6	7.0
Fuel processing	9.7	9.5	10.2
Electric power generation	17.6	21.6	8.9
Transportation of energy	11.8	14.1	6.9
Energy storage	4.4	3.7	5.8
Energy utilization, management	14.7	15.4	13.1
Fuel reprocessing or disposal	4.2	5.0	2.6
Conservation	18.4	19.4	16.1
Environmental impact	11.3	10.7	12.4
Education, training	4.3	3.2	6.7
Other	8.1	4.3	16.1

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

[a] Respondents were asked to check any activity in which they were involved. Many respondents checked more than one category.

Table 11. Major Energy-Related Activity Involved in Occupations of Energy-Related 1972 Graduates in 1978

Energy-Related Activity	Scientists and Engineers (Percent)	Engineers (Percent)	Scientists (Percent)
Exploration	10.3	3.0	28.9
Extraction	8.1	9.8	3.7
Manufacturing and processing	15.6	18.6	7.7
Electric power generation	12.5	14.0	8.8
Transportation and storage	8.7	10.2	4.9
Conservation	7.0	8.4	3.4
Environmental impact	3.7	2.7	6.3
Other	17.5	14.8	24.2
No answer	16.6	18.5	12.0
Total	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table 12. Major Energy-Related Activity Involved in Occupations of Energy-Related 1976 Graduates in 1978

Energy-Related Activity	Scientists and Engineers (Percent)	Engineers (Percent)	Scientists (Percent)
Exploration	11.6	5.2	25.3
Extraction	7.3	8.6	4.5
Manufacturing and processing	15.4	18.1	9.4
Electric power generation	11.3	15.0	3.6
Transportation and storage	7.8	9.0	5.2
Conservation	10.1	10.2	10.0
Environmental impact	5.8	4.8	7.8
Other	15.5	13.0	20.8
No answer	15.3	16.2	13.2
Total	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table 13. Primary Work Activity Versus Major Energy-Related Activity: Energy-Related 1972 Graduates in 1978[a]

	Energy-Related Activity							
Work Activity	Exploration (Percent)	Extraction (Percent)	Manufacturing or Processing (Percent)	Generation (Percent)	Transportation or Storage (Percent)	Conservation (Percent)	Environmental Impact (Percent)	Other (Percent)
Management	8.8	23.2	16.8	20.5	20.0	27.7	8.7	18.3
Teaching	0.0	0.8	0.8	0.0	0.0	11.1	0.0	6.5
Basic research	5.0	3.7	1.7	5.0	1.4	6.3	12.1	8.1
Applied research	24.6	6.0	2.9	5.7	4.9	0.9	7.3	13.1
Development	9.8	9.7	11.1	4.0	0.7	12.2	2.9	4.5
Report, technical writing	3.9	1.1	7.7	9.4	4.4	5.0	28.2	2.2
Design	0.0	17.5	16.6	13.7	18.1	7.4	1.3	6.9
Quality control	5.8	1.8	6.5	9.5	10.9	4.9	2.3	0.0
Operations	9.7	23.3	17.8	19.1	19.1	7.8	6.2	4.5
Distribution	0.0	5.3	10.5	2.4	0.0	2.7	2.4	7.7
Consulting	5.4	5.4	0.9	3.3	18.2	9.3	19.8	3.0
Other	26.9	2.1	6.8	7.7	2.3	4.7	9.0	25.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table 14. Primary Work Activity Versus Major Energy-Related Activity: Energy-Related 1976 Graduates in 1978[a]

	Energy-Related Activity							
Work Activity	Exploration (Percent)	Extraction (Percent)	Manufacturing or Processing (Percent)	Generation (Percent)	Transportation or Storage (Percent)	Conservation (Percent)	Environmental Impact (Percent)	Other (Percent)
Management	9.7	7.6	8.3	18.0	8.7	10.0	0.9	15.9
Teaching	2.0	0.0	1.1	0.4	0.0	2.3	4.0	3.8
Basic research	8.5	2.0	9.2	5.8	3.0	9.1	13.4	6.7
Applied research	17.3	8.1	4.3	6.2	7.8	11.5	9.6	11.2
Development	9.7	8.3	14.7	4.3	1.2	6.4	0.6	7.1
Report, technical writing	8.3	5.5	2.7	8.7	3.9	6.0	26.4	8.9
Design	3.4	9.1	19.7	18.6	21.9	15.6	4.2	7.9
Quality control	8.8	5.9	8.9	12.2	1.8	1.4	10.3	8.6
Operations	11.9	36.8	16.6	16.5	22.8	8.9	5.4	5.8
Distribution	3.4	0.7	8.6	0.4	8.3	4.4	7.7	1.0
Consulting	1.6	1.2	0.8	3.9	3.8	3.4	6.4	4.4
Other	15.3	14.9	5.2	5.1	16.7	17.2	4.6	11.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

TOTAL POPULATION AND ENERGY-RELATED NEW ENTRANTS

MAJOR FIELD OF STUDY VERSUS OCCUPATION

As Table 15 illustrates, more engineers than scientists were employed in the same field as their college major. On the whole, energy-related scientists and engineers were more often employed in their major field than was the total population of science and engineering graduates. Differences between the total and energy-related populations were most pronounced among 1972 science graduates, and least pronounced among the 1976 engineering graduates. A more detailed comparison of major field of study and occupation for energy-related graduates can be found in Appendix A, Tables A-27 and A-28.

Table 16 compares college major with occupation for bachelor's and master's recipients. Predictably, scientists with master's degrees are more likely than those with bachelor's degrees to be employed in the field of their college major. However, engineers with master's degrees are only slightly more likely to hold engineering jobs than their bachelor's-level counterparts.

EDUCATIONAL ATTAINMENT BY MAJOR

Tables 17 and 18 show that energy-related scientists and engineers are more likely to have advanced degrees than the total group of respondents. Of the energy-related group, 47.3 percent held a master's or higher degree of the 1972 graduates, and 31.4 percent of the 1976 graduates. Of all the scientists and engineers surveyed, 41.9 percent held a master's or higher degree among 1972 graduates, and 25.1 percent of 1976 graduates held advanced degrees.

Energy-related scientists account for the major portion of this difference. Of all science majors who graduated in 1972, 29.8 percent earned master's or higher degrees, while this was true of 43.7 percent of the energy-related scientists. Of 1976 graduates, 19.2 percent of all science majors and 26.7 percent of energy-related science majors held degrees higher than a bachelor's. Predictably, a higher proportion of 1972 graduates than of 1976 graduates have earned advanced degrees.

EDUCATIONAL ATTAINMENT BY OCCUPATION

Differences in educational attainment are also evident between the energy-related and the total population of new entrants into the work force when they are classified by occupation. On the whole, energy-related respondents seem slightly more likely to hold advanced degrees, especially those working as scientists (Tables 19 and 20).

RACE

Although the proportion of non-whites who majored in science and engineering increased from 5.1 percent of the 1972 graduates to 6.6 percent of the 1976 graduates, the proportion of non-whites who indicated that they were working on energy-related problems declined (Table 21). Engineers account for the majority of the fluctuation. Among those who graduated in 1972, 5.5 percent of all engineering graduates were non-white and 7.6 percent of energy-related engineering graduates were non-white. For the class of 1976, the respective figures were 7.6 percent and 4.4 percent.

By occupation, 5.5 percent of all employed 1972 scientists and engineers were non-white, as were 6.9 percent of the energy-related scientists and engineers. For 1976, 7.1 percent of the total, and 4.4 percent of the energy-related group were non-white. This suggests that non-whites are more likely to work in energy-related areas as they gain experience--especially non-white engineers.

SEX

A higher percentage of the graduates in science and engineering in 1976 (29.2 percent) were female than in 1972 (21.6 percent) (Table 22). The proportion of energy-related females also rose between 1972 and 1976. However, the representation of women in the energy-related group remained comparatively small (6.0 percent of 1972 graduates, and 13.5 percent of 1976 graduates). One finds similar results in the distribution of females by occupation. Although 14.5 percent of the class of 1972 scientists and engineers and 22.2 percent of the class of 1976 scientists and engineers were female, the figures for the energy-related group were 5.8 percent and 9.6 percent, respectively.

Most of this difference can be attributed to the small proportion of energy-related female scientists. Since 82 percent of all female scientists who graduated in 1972, and 85 percent of those who graduated in 1976 held degrees in either the life or social sciences, these results are reasonable. Few life or social scientists are involved in energy-related activities.

TYPE OF EMPLOYER

Most of the engineers and a sizable number of the scientists surveyed were employed by private industry. Among the energy-related, an even larger proportion of engineers (87.2 percent of 1972 graduates; 82.9 percent of 1976 graduates) and scientists (70.6 percent of 1972 graduates; 59.3 percent of 1976 graduates) worked for private industry (Tables 23 and 24). Educational institutions employed the second largest proportion of 1976 energy-related science and engineering graduates. Of the 1972 graduates, the second largest group of energy-related scientists worked in educational institutions, but more engineers were employed in the federal government than in education. Type of employer is shown separately for bachelor's and master's recipients in Appendix A, Tables A-29 and A-30.

PRIMARY WORK ACTIVITY

More of the energy-related scientists and engineers listed applied research, design, and operations as their primary work activity than the total population of scientists and engineers (Tables 25 and 26). These activities are common among engineers, who make up a much larger proportion of the energy-related group than of the total population. Slightly more of the energy-related scientists than total scientists indicated basic research as their primary work activity, and fewer energy-related than total scientists were involved in management or teaching activities. Energy-related engineers were as likely to be involved in management as all other engineers and less likely to be involved in development. Differences between energy-related and total engineers are less pronounced than between energy-related and total scientists.

Since the 1972 graduates have been in the work force longer than the 1976 graduates, one might expect to find a larger group of 1972 graduates in management positions. Tables 19 and 20 show this to be the case. Of all scientists and engineers who graduated in 1972, 16.9 percent and 17.7 percent of the energy-related responded that management was their primary work activity. Of the 1976 graduates, 11.0 percent and 11.8 percent of the total and energy-related groups were primarily involved in management. Tables A-31 through A-34 in Appendix A also show the predictable results that engineers with master's degrees are more likely than bachelor's-level graduates to hold management positions, and less likely to work in design, quality control, or operations. Except for the energy-related 1972 graduates, master's-level scientists were no more likely than their bachelor's-level counterparts to hold management positions. Instead, more of the scientists with master's degrees were involved in teaching activities or research.

TYPE OF EMPLOYMENT

Tables 27 and 28 indicate the type of employment held by the energy-related and total employed respondents. Findings here support the results in Table 9—that the energy-related are much more likely than the total population of scientists and engineers to be employed in a field related to their college majors. Tables A-35 through A-38 in Appendix A show these results in more detail.

MEDIAN SALARY

For all scientists and engineers who graduated in 1972, the median annual salary was $17,000 (Table 29), and for the 1976 graduates, $12,500 (Table 30). Median annual salaries for energy-related scientists and engineers were 29 percent and 40 percent higher for 1972 and 1976 graduates, respectively. Energy-related engineers of both classes reported salaries 3 to 5 percent higher than all engineers, and energy-related scientists reported salaries approximately 25 percent higher than salaries for all scientists. Among the energy-related 1972 graduates, mechanical engineers and nuclear, petroleum, and mining engineers reported the highest salaries. Chemical, nuclear, petroleum, and mining engineers earned the highest salaries among 1976 graduates. Of the energy-related scientists, the environmental scientists reported the highest median salaries.

Of the 1972 science and engineering graduates, the largest differences between the energy-related and total populations are found between social scientists (a difference of 33 percent by both occupation and degree) and between environmental scientists (35 percent by college major, 15 percent by occupation). The same is true of 1976 science and engineering graduates. Energy-related environmental scientists reported median salaries 35 to 40 percent higher than the total population of environmental scientists who graduated in 1976. By occupation, energy-related social scientists earned 42 percent more than all social scientists of the 1976 class.

In contrast, energy-related electrical or electronic engineers of both classes reported median salaries the same or slightly lower than the salaries reported by all electrical or electronic engineers. For the 1976 graduates, this applies also to mechanical engineers. Separate salary information for bachelor's and master's recipients is contained in Tables A-39 through A-42.

Table 15. Comparison of Major Field of Study for Highest Degree Held and Occupation: Total Versus Energy-Related Graduates in 1978

Major	Total: 1972 Graduates (Thousands)	Total: 1976 Graduates (Thousands)	Percentage with Occupation Same as College Major: 1972 Graduates (Percent)	Percentage with Occupation Same as College Major: 1976 Graduates (Percent)
Science and engineering				
Total	287	305	42.5	46.7
Energy-related	21	26	75.4	73.4
Engineering				
Total	65	61	76.2	82.8
Energy-related	12	12	89.6	91.6
Science				
Total	223	244	32.7	37.6
Energy-related	9	14	55.2	53.1

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: In this table, the science and engineering fields are not subdivided into specialty areas. All graduates are included if their occupation is in the same major field (either science or engineering) in which they hold their highest degree.

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Table 16. Comparison of Major Field of Study for Highest Degree Held and Occupation: Master's Versus Bachelor's in 1978

Major	Percent with Occupation Same as College Major			
	1972 Graduates		1976 Graduates	
	Bachelor's (Percent)	Master's (Percent)	Bachelor's (Percent)	Master's (Percent)
Science and engineering				
Total	30.5	63.0	38.9	72.8
Energy-related	69.8	81.3	67.2	83.3
Engineering				
Total	74.0	78.8	82.4	83.4
Energy-related	90.0	89.0	90.4	94.0
Science				
Total	19.6	55.7	30.1	67.9
Energy-related	39.9	70.0	44.0	77.5

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: In this table, the science and engineering fields are not subdivided into specialty areas. All graduates are included if their occupation is in the same major field (either science or engineering) in which they hold their highest degree.

Table 17. Educational Attainment by Major Field of Study for Highest Degree Held: Total Versus Energy-Related 1972 Graduates in 1978

Major	Total: Bachelor's (Percent)	Total: Master's (Percent)	Total: Doctorate (Percent)	Energy-Related: Bachelor's (Percent)	Energy-Related: Master's (Percent)	Energy-Related: Doctorate (Percent)
Engineering						
Chemical	65.9	27.4	6.7	60.2	32.8	7.0
Civil	64.1	32.9	3.0	46.2	46.0	7.9
Electrical or electronic	59.4	28.2	2.4	69.7	26.8	3.5
Mechanical	64.6	32.7	2.7	60.3	34.7	5.0
Nuclear, petroleum, or mining	41.8	49.0	9.2	41.9	47.4	10.7
Other	59.1	37.4	3.5	64.0	26.1	9.9
Total, engineering	60.6	36.0	3.4	58.9	34.3	6.8
Science						
Physical	51.3	32.1	16.6	23.6	44.2	32.2
Math and computer	60.0	35.5	4.4	46.7	49.3	4.0
Environmental	58.4	32.2	9.4	40.4	49.6	10.0
Life	70.0	21.6	8.3	71.6	23.5	4.9
Psychology and social	75.9	17.9	6.1	87.8	9.9	2.3
Total, science	70.3	22.5	7.3	56.4	33.2	10.5
Other	0.0	69.0	31.0	0.0	82.3	17.7
Total	58.1	31.9	10.0	52.7	38.1	9.2

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table 18. Educational Attainment by Major Field of Study for Highest Degree Held: Total Versus Energy-Related 1976 Graduates in 1978

Major	Total			Energy-Related		
	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)
Engineering						
Chemical	64.7	33.2	2.1	59.8	37.8	2.4
Civil	70.6	29.2	0.2	66.2	33.1	0.7
Electrical or electronic	63.3	32.6	0.5	69.5	30.5	0.0
Mechanical	70.1	29.5	0.4	75.8	24.2	0.0
Nuclear, petroleum, or mining	47.0	47.0	6.1	41.5	55.0	3.5
Other	64.1	35.5	0.3	71.0	28.7	0.2
Total, engineering	65.3	34.0	0.7	66.2	32.9	0.9
Science						
Physical	71.9	26.4	1.7	57.1	36.0	6.9
Math and computer	69.3	29.6	1.1	77.9	20.7	1.3
Environmental	72.2	27.2	0.6	56.9	42.0	1.1
Life	84.3	15.0	0.8	83.4	16.6	0.0
Psychology and social	82.7	16.4	0.9	80.5	19.5	0.0
Total, science	80.8	18.3	0.9	73.3	25.4	1.3
Other	0.0	85.7	14.3	0.0	96.2	3.8
Total	75.0	23.7	1.4	68.6	30.3	1.1

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table 19. Educational Attainment by Occupation: Total Versus Energy-Related 1972 Graduates in 1978

Occupation	Total			Energy-Related		
	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)
Engineering						
Chemical	54.5	33.9	11.6	48.3	45.3	6.4
Civil	65.2	32.4	2.3	42.6	52.0	5.4
Electrical or electronic	54.3	43.4	2.3	63.9	32.3	3.8
Mechanical	58.5	37.8	3.6	47.0	48.0	5.0
Nuclear, petroleum, or mining	56.5	35.5	8.0	58.3	33.7	8.1
Other	59.8	36.5	3.7	64.9	30.3	4.8
Total, engineering	58.5	37.6	3.9	56.5	37.8	5.7
Science						
Physical	35.5	37.0	27.5	22.7	34.8	42.5
Math and computer	53.4	41.4	5.2	59.8	36.4	3.9
Environmental	34.0	41.8	24.2	37.4	50.7	11.8
Life	50.3	31.0	18.7	19.2	67.0	13.8
Psychology and social	24.3	51.1	24.7	62.8	32.8	4.4
Total, science	40.4	41.4	18.2	40.4	43.0	16.6
Other	65.3	26.1	8.6	53.7	35.0	11.2
Total	58.1	31.8	10.1	52.2	38.6	9.2

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table 20. Educational Attainment by Occupation: Total Versus Energy-Related 1976 Graduates in 1978

Occupation	Total			Energy-Related		
	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)
Engineering						
Chemical	67.8	30.4	1.8	59.9	38.0	2.1
Civil	69.1	30.9	0.0	62.8	37.2	0.0
Electrical or electronic	63.8	35.6	0.6	63.5	36.5	0.0
Mechanical	70.7	29.0	0.4	79.2	20.5	0.3
Nuclear, petroleum, or mining	69.7	27.0	3.3	66.3	31.2	2.5
Other	66.8	32.7	0.5	66.1	33.7	0.2
Total, engineering	67.4	31.9	0.8	68.2	30.9	0.9
Science						
Physical	68.0	29.8	2.2	63.5	30.4	6.0
Math and computer	62.4	36.8	0.8	70.4	27.9	1.7
Environmental	60.4	38.3	1.2	51.8	47.0	1.3
Life	73.4	25.0	1.7	55.8	44.2	0.0
Psychology and social	50.9	44.2	4.9	49.3	50.7	0.0
Total, science	63.0	34.6	2.4	58.5	39.2	2.2
Other	85.2	13.8	1.0	87.6	12.4	0.0
Total	74.9	23.7	1.4	68.6	30.3	1.1

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

Table 21. Percentage Non-White: Total Versus Energy-Related Graduates in 1978

	Total		Energy-Related	
Major	1972 Graduates (Percent)	1976 Graduates (Percent)	1972 Graduates (Percent)	1976 Graduates (Percent)
Science and engineering	5.1	6.6	6.5	4.9
Engineering	5.5	7.6	7.6	4.4
Science	5.0	6.3	5.0	5.4
Occupation				
Science and engineering	5.5	7.1	6.9	4.4
Engineering	5.3	7.2	8.1	4.1
Science	5.6	7.1	3.9	4.9

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table 22. Percentage Female: Total Versus Energy-Related Graduates in 1978

	Total		Energy-Related	
Major	1972 Graduates (Percent)	1976 Graduates (Percent)	1972 Graduates (Percent)	1976 Graduates (Percent)
Science and engineering	21.6	29.2	6.0	13.5
Engineering	1.0	3.7	0.8	4.3
Science	27.6	35.6	13.3	23.7
Occupation				
Science and engineering	14.5	22.2	5.8	9.6
Engineering	2.7	6.2	2.1	5.5
Science	23.4	32.4	15.1	18.3

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table 23. Type of Employer by Occupation: Total Versus Energy-Related 1972 Graduates in 1978

Type of Employer	All Scientists and Engineers		Engineers		Scientists	
	Total	Energy-Related	Total	Energy-Related	Total	Energy-Related
	(Percent)		(Percent)		(Percent)	
Private industry	53.3	82.5	75.5	87.2	36.6	70.6
Educational institution	18.7	5.3	2.7	1.4	30.8	15.0
Federal government	10.2	5.9	9.5	4.9	10.7	8.5
State and local government	8.7	2.1	6.2	1.6	10.6	3.4
Non-profit organization	2.6	2.7	1.6	3.0	3.4	2.0
Other	5.5	0.8	3.1	1.1	7.5	0.0
No answer	0.9	0.7	1.3	0.7	0.5	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table 24. Type of Employer by Occupation: Total Versus Energy-Related 1976 Graduates in 1978

Type of Employer	All Scientists and Engineers		Engineers		Scientists	
	Total	Energy-Related	Total	Energy-Related	Total	Energy-Related
	(Percent)		(Percent)		(Percent)	
Private industry	51.9	75.4	77.7	82.9	35.5	59.3
Educational institution	18.9	12.6	5.4	7.8	27.5	22.9
Federal government	7.9	5.7	7.7	5.0	8.0	7.0
State and local government	8.9	1.7	4.4	0.3	11.9	4.8
Non-profit organization	3.9	1.9	0.7	1.1	5.9	3.6
Other	7.5	0.6	3.0	0.5	10.4	1.1
No answer	0.9	2.1	1.0	2.5	0.8	2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table 25. Primary Work Activity by Occupation: Total Versus Energy-Related 1972 Graduates in 1978

Activity	All Scientists and Engineers		Engineers		Scientists	
	Total	Energy-Related	Total	Energy-Related	Total	Energy-Related
	(Percent)		(Percent)		(Percent)	
Management	16.9	17.7	21.9	21.3	13.2	8.5
Teaching	8.1	2.2	1.6	1.7	13.1	3.3
Basic research	7.6	5.1	1.0	1.5	12.6	14.5
Applied research	6.6	9.0	4.0	6.8	8.6	14.7
Development	8.8	8.1	14.2	9.4	4.6	5.0
Report, technical writing	5.7	6.0	6.0	5.6	5.5	7.1
Design	7.1	12.6	15.3	17.1	1.0	1.1
Quality control	4.8	5.3	6.2	5.1	3.8	6.0
Operations	8.9	11.5	16.0	15.1	3.6	2.4
Distribution	2.0	1.7	1.7	2.4	2.2	0.0
Consulting	3.9	6.1	4.4	5.7	3.5	7.1
Other	18.6	14.6	7.1	8.4	27.2	30.2
No answer	0.9	0.0	0.6	0.0	1.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table 26. Primary Work Activity by Occupation: Total Versus Energy-Related 1976 Graduates in 1978

Activity	All Scientists and Engineers		Engineers		Scientists	
	Total	Energy-Related	Total	Energy-Related	Total	Energy-Related
	(Percent)		(Percent)		(Percent)	
Management	11.0	11.8	12.3	14.5	10.3	6.2
Teaching	6.6	1.5	1.0	0.7	10.3	3.3
Basic research	9.4	7.3	1.9	2.5	14.2	17.3
Applied research	7.5	10.6	4.7	5.4	9.3	21.8
Development	7.9	8.0	13.7	9.1	4.3	5.7
Report, technical writing	8.1	6.4	8.3	7.0	8.0	5.1
Design	8.0	13.8	18.0	19.3	1.6	2.1
Quality control	7.2	6.8	9.8	7.6	5.5	5.1
Operations	9.9	14.3	17.1	20.4	5.2	1.5
Distribution	2.1	2.1	1.1	2.2	2.7	1.9
Consulting	2.6	3.6	3.7	4.8	1.9	1.1
Other	18.6	13.5	7.7	6.5	25.6	28.6
No answer	1.0	0.2	0.6	0.1	1.3	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table 27. Employment Status: Total Versus Energy-Related 1972 Graduates in 1978

Employment	Total (Percent)	Energy-Related (Percent)
Full-time, science or engineering	38.2	79.5
Full-time, non-science, non-engineering	53.2	17.8
Part-time	6.5	2.1
Postdoctoral	2.0	0.6
Total	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table 28. Employment Status: Total Versus Energy-Related 1976 Graduates in 1978

Employment	Total (Percent)	Energy-Related (Percent)
Full-time, science or engineering	42.6	75.7
Full-time, non-science, non-engineering	43.3	13.7
Part-time	13.4	10.0
Postdoctoral	0.7	0.6
Total	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table 29. Median Salary: Total Versus Energy-Related 1972 Graduates in 1978

Field	Occupation			Major		
	Total (Dollars)	Energy-Related (Dollars)	Ratio of Energy-Related to Total	Total (Dollars)	Energy-Related (Dollars)	Ratio of Energy-Related to Total
Engineering						
Chemical	22,000	22,500	1.02	22,000	23,000	1.05
Civil	20,000	23,200	1.16	20,300	23,500	1.16
Electrical or electronic	22,800	22,000	0.96	22,500	22,000	0.98
Mechanical	22,000	24,000	1.09	22,000	23,000	1.05
Nuclear, petroleum, or mining	23,400	24,000	1.03	23,000	26,000	1.13
Other	20,300	20,100	0.99	21,000	20,600	0.98
Total, engineering	21,500	22,500	1.05	21,900	22,600	1.03
Science						
Physical	17,100	21,600	1.26	17,000	20,000	1.18
Math and computer	19,600	20,000	1.02	18,300	20,300	1.11
Environmental	20,000	23,000	1.15	17,000	23,000	1.35
Life	15,500	15,900	1.03	15,000	17,000	1.13
Psychology and social	16,500	22,000	1.33	15.000	20,000	1.33
Total, science	17,200	21,000	1.22	15,500	20,000	1.29
Other	15,000	21,000	1.40	15,700	23,000	1.46
Total	17,000	22,000	1.29	17,000	22,000	1.29

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: All figures have been rounded to the nearest hundred. Salaries for respondents academically employed for 9 to 10 months have been adjusted by a factor of 11/9.

Table 30. Median Salary: Total Versus Energy-Related 1976 Graduates in 1978

	Occupation			Major		
Field	Total (Dollars)	Energy-Related (Dollars)	Ratio of Energy-Related to Total	Total (Dollars)	Energy-Related (Dollars)	Ratio of Energy-Related to Total
Engineering						
Chemical	19,000	20,000	1.05	20,000	20,700	1.04
Civil	16,800	18,000	1.07	16,900	19,000	1.12
Electrical or electronic	18,000	18,000	1.00	18,000	18,000	1.00
Mechanical	18,000	18,000	1.00	18,200	18,300	1.01
Nuclear, petroleum, or mining	18,300	19,500	1.07	19,000	20,000	1.05
Other	17,000	18,200	1.07	17,000	18,500	1.09
Total, engineering	17,700	18,400	1.04	18,000	18,800	1.04
Science						
Physical	12,000	14,000	1.17	12,000	14,000	1.17
Math and computer	16,000	17,000	1.06	15,300	16,800	1.10
Environmental	13,500	18,200	1.35	13,000	18,200	1.40
Life	10,400	10,000	0.96	11,000	12,000	1.09
Psychology and social	11,000	15,600	1.42	11,000	12,000	1.09
Total, science	12,000	15,000	1.25	11,500	14,400	1.25
Other	11,500	13,000	1.04	15,000	17,600	1.17
Total	12,500	17,500	1.40	12,500	17,500	1.41

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: All figures have been rounded to the nearest hundred. Salaries for respondents academically employed for 9 to 10 months have been adjusted by a factor of 11/9.

COMPARISON OF 1976 AND 1978 SURVEYS OF RECENT GRADUATES

In 1976, Westat conducted an earlier version of the 1978 survey just discussed.[4] Though the sampling techniques used differed slightly between these two surveys, the 1976 graduates who responded to the *1978 National Survey of Recent Science and Engineering Graduates* should be roughly comparable to the 1974-75 graduates sampled in the 1976 survey. Both groups were surveyed one or two years after graduation. Respondents to the 1978 survey who graduated in 1972 had been in the work force longer and accumulated more experience. (Approximately 65 percent of 1972 graduates reported five or more years of professional experience, while 65 percent of 1976 graduates reported less than three years experience.) Differences between the responses of 1976 and 1974-75 graduates should indicate differences in the opportunities for new scientists and engineers between 1976 and 1978. The 1972 graduates, when compared with the other two groups, should indicate how employment opportunities may change as the new scientists and engineers gain experience.

MAJOR FIELD AND OCCUPATION

Fewer of the 1974-75 graduates responded that their work was energy-related than did graduates of either 1972 or 1976 (Tables 31 and 32). This probably reflects increased national attention to energy issues between 1976 and 1978, when the surveys were taken. The attention may have increased opportunities in energy-related projects. Alternatively, it may mean that people in 1978 were more aware of the connections between their jobs and energy concerns than they were in 1976.

The 1976 survey indicated a strong demand for engineers; 81.1 percent of all engineering graduates surveyed in that year had found employment in engineering. An even higher proportion of the energy-related engineering graduates were employed as engineers (Table 33). Demand for science graduates was not as strong, and only 40.0 percent of the 1974-75 science graduates held jobs in science. However, 55.5 percent of the energy-related science graduates were employed as scientists.

The results from the 1978 survey of 1972 and 1976 graduates were strikingly similar. Of the 1972 engineering graduates, 76.2 percent of the total, and 89.6 percent of the energy-related were employed as engineers. Of the 1976 engineering graduates, 82.8 percent of the total, and 91.6 percent of the energy-related graduates were working as engineers. Among the science graduates, 32.7 percent of the total population and 55.2 percent of the energy-related population worked in some branch of science. For 1976 science graduates, the respective figures were 37.6 percent and 53.1 percent.

EDUCATIONAL ATTAINMENT

Table 34 indicates educational attainment by major field of study for total and energy-related 1972 graduates. Tables 35 and 36 list the same information for 1974-75 and 1976 graduates, respectively. In Tables 37, 38 and 39, information is given on educational attainment by occupation for each respective class. By major field of study, the pattern of educational attainment, both for the energy-related and for the total number of scientists and engineers, changed little between the 1974-75 and 1976 graduates (Tables 35 and 36). For both years, the level of educational attainment among engineers was not significantly different between total and energy-related groups. Energy-related science majors were still more likely than all scientists of the same class year to hold advanced degrees. However, the proportion of energy-related science majors with a master's degree or higher declined from 34.0 percent among 1974-75 graduates to 26.7 percent among 1976 graduates, while nearly the same percentage of all science majors earned higher degrees. Occupationally, the same relative number of energy-related scientists held advanced degrees of the 1976 and 1974-75 graduates (Tables 38 and 39). But the percentage of all scientists with degrees above the bachelor's level increased in 1976 and approached the proportion of energy-related scientists with advanced degrees.

Graduates of 1972 have had more time in which to earn additional degrees, and have used the opportunity (Tables 34 and 37). Approximately 40 percent of 1972 engineering majors (total and energy-related) held master's degrees or higher, as opposed to 31 percent to 35 percent (Tables 36 and 37) among the later graduates. Of all 1972 science majors, 29.8 percent held advanced degrees, as well as 43.7 percent of the energy-related science majors. By occupation, an even higher proportion of 1972 scientists held degrees beyond the bachelor's: 59.6 percent of the total, and 59.6 percent of the energy-related.

RACE

In all categories, the percentage of non-white scientists and engineers increased in the 1976 class over the percentages for the two earlier classes (Table 40). For the total sample, the increase was most noticeable among engineering majors. The changes in the proportion of non-white energy-related scientists and engineers are somewhat puzzling. It may be helpful here to consider that the 1972 and 1976 graduates were surveyed in 1978, while the 1974-75 graduates were surveyed in 1976. The larger sample size, and larger number of energy-related respondents in the 1978 survey than in the earlier survey, could account for this difference. Alternatively, Table 34 may indicate that non-whites with a recent degree in science or engineering were more likely in 1978 than in 1976 to be employed in energy-related projects. Figures for 1972 graduates might indicate further that more experienced non-whites are even more likely than recent graduates to work on energy problems.

The apparent increase in energy-related non-whites between the 1976 and 1978 surveys may also reflect the way people view their jobs. As discussed earlier, people may have been more likely to consider themselves energy-related in 1978 than in 1976 due to increased national awareness of energy problems. If such a change in perceptions has occurred, the difference in the proportion of energy-related non-whites between the 1976 and 1978 surveys may not be as large as it appears.

SEX

From 21.6 percent in 1972, the proportion of women graduating in science and engineering increased to 29.2 percent of the 1976 class (Table 41). However, nearly all of these women majored in science. The percentage of female engineers (though small) was roughly the same or higher for energy-related graduates than for all graduates in each survey group. But a smaller proportion of women scientists were represented in the energy-related group than in the total number of scientists. This may be explained by the fact that 85 percent of all female scientists in the class of 1976, and 82 percent of the female scientists in the class of 1972 held degrees in life or social sciences. Only a small proportion of graduates in these fields are involved with energy problems (Table 31).

TYPE OF EMPLOYER

Private industry consistently employed the majority of scientists and engineers in all three groups surveyed (Tables 42 through 44). In all groups an even larger proportion of energy-related than total respondents worked for private industry. The difference between energy-related and total scientists was the most dramatic: the 60-70 percent of energy-related scientists in private industry was nearly double the proportion of all scientists working for private firms. Educational institutions employed a larger proportion of all scientists than of energy-related scientists, especially among 1972 graduates, and a much higher percentage of scientists than of engineers.

PRIMARY WORK ACTIVITY

In general, energy-related respondents, especially engineers, were more likely than all respondents to be involved in applied research, design, and operations (Tables 45 through 47). Energy-related scientists were less likely to be involved in teaching activities than all other scientists. Among 1972 and 1976 graduates, all scientists were less likely than energy-related scientists to be active in basic research. Engineers who graduated in 1972 were much more likely than engineers from later classes to hold management positions. This was not true for the corresponding group of scientists.

Table 31. Comparison of 1978 and 1976 Survey: Percent Energy-Related Versus Major Field of Study for Highest Degree Held

Major	1978 Survey		1976 Survey
	1972 Graduates (Percent)	1976 Graduates (Percent)	1974-75 Graduates (Percent)
Engineering			
Chemical	31.9	42.5	23.2
Civil	15.3	18.4	16.6
Electrical or electronic	14.5	14.1	14.3
Mechanical	31.5	34.7	24.5
Other	16.4	19.8	15.5
Total, engineering	19.3	22.1	17.5
Science			
Physical	10.8	11.5	4.3
Environmental	18.5	24.6	16.8
Other	2.7	3.8	1.3
Total, science	4.0	5.0	1.8
Other	4.2	3.4	0.4
Total	7.0	8.3	4.6

Source: 1976 Survey: Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147; and 1978 Survey: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table 32. Comparison of 1978 and 1976 Survey:
Percent Energy-Related Versus Occupation

Occupation	1978 Survey		1976 Survey
	1972 Graduates (Percent)	1976 Graduates (Percent)	1974-75 Graduates (Percent)
Engineering			
Chemical	32.0	35.9	29.0
Civil	10.0	17.5	17.1
Electrical or electronic	13.8	14.4	18.5
Mechanical	40.0	37.5	31.4
Other	25.5	24.8	18.8
Total, engineering	23.3	24.5	21.0
Science			
Physical	15.4	18.0	6.5
Environmental	33.2	34.0	26.6
Other	3.7	4.1	2.0
Total, science	6.8	7.3	3.4
Other	2.0	2.6	1.4
Total	7.0	8.3	4.6

Source: 1976 Survey: Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147; and 1978 Survey: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table 33. Comparison of Major Field of Study for Highest Degree Held and Occupation: Total Versus Energy-Related Graduates

Major	Percent with Occupation Same as College Major		
	1972 Graduates in 1978 (Percent)	1974-75 Graduates in 1976 (Percent)	1976 Graduates in 1978 (Percent)
Science and engineering			
Total	42.5	48.9	46.7
Energy-related	75.4	79.9	73.4
Engineering			
Total	76.2	81.1	82.8
Energy-related	89.6	91.1	91.6
Science			
Total	32.7	40.0	37.6
Energy-related	55.2	55.5	53.1

Source: 1974-75 Graduates column from Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147. 1972 and 1976 Graduates columns from Westat, Inc./ National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: In this table, the science and engineering fields are not subdivided into specialty areas. All graduates are included if their occupation is in the same major field (either science or engineering) in which they hold their highest degree.

Table 34. Educational Attainment by Major Field of Study for Highest Degree Held: Total Versus Energy-Related 1972 Graduates in 1978

Major	Total			Energy-Related		
	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)
Engineering						
Chemical	65.9	27.4	6.7	60.2	32.8	7.0
Civil	64.1	32.9	3.0	46.2	46.0	7.9
Electrical or electronic	59.4	28.2	2.4	69.7	26.8	3.5
Mechanical	64.6	32.7	2.7	60.3	34.7	5.0
Nuclear, petroleum, or mining	41.8	49.0	9.2	41.9	47.4	10.7
Other	59.1	37.4	3.5	64.0	26.1	9.9
Total, engineering	60.6	36.0	3.4	58.9	34.3	6.8
Science						
Physical	51.3	32.1	16.6	23.6	44.2	32.2
Math and computer	60.0	35.5	4.4	46.7	49.3	4.0
Environmental	58.4	32.2	9.4	40.4	49.6	10.0
Life	70.0	21.6	8.3	71.6	23.5	4.9
Psychology and social	75.9	17.9	6.1	87.8	9.9	2.3
Total, science	70.3	22.5	7.3	56.4	33.2	10.5
Other	0.0	69.0	31.0	0.0	82.3	17.7
Total	58.1	31.9	10.0	52.7	38.1	9.2

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table 35. Educational Attainment by Major Field of Study for Highest Degree Held: Total Versus Energy-Related 1974-75 Graduates in 1976

Major	Total Bachelor's (Percent)	Total Master's (Percent)	Total Doctorate (Percent)	Energy-Related Bachelor's (Percent)	Energy-Related Master's (Percent)	Energy-Related Doctorate (Percent)
Engineering						
Chemical	74.3	22.6	3.2	62.6	37.4	0.0
Civil	66.6	33.4	0.0	59.9	40.1	0.0
Electrical or electronic	70.3	28.7	1.0	69.5	30.5	0.0
Mechanical	79.5	19.2	1.3	78.7	21.3	0.0
Other[a]	62.5	36.7	0.7	58.6	39.3	2.0
Total, engineering	68.9	30.1	1.0	66.1	33.2	0.6
Science						
Physical	74.4	24.6	1.0	62.6	37.4	0.0
Environmental	70.0	30.0	0.0	52.1	47.9	0.0
Other[a]	83.0	15.9	1.1	70.5	29.5	0.0
Total, science	82.1	16.8	1.0	66.0	34.0	0.0
Other	0.0	90.3	9.7	0.0	100.0	0.0
Total	78.2	20.6	1.2	66.0	33.6	0.4

Source: Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147.

[a] The report from which this table is reproduced did not include separate information on life, social, math, and computer scientists, or on nuclear, petroleum, and mining engineers.

Table 36. Educational Attainment by Major Field of Study for Highest Degree Held: Total Versus Energy-Related 1976 Graduates in 1978

Major	Total			Energy-Related		
	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)
Engineering						
Chemical	64.7	33.2	2.1	59.8	37.8	2.4
Civil	70.6	29.2	0.2	66.2	33.1	0.7
Electrical or electronic	63.3	32.6	0.5	69.5	30.5	0.0
Mechanical	70.1	29.5	0.4	75.8	24.2	0.0
Nuclear, petroleum, or mining	47.0	47.0	6.1	41.5	55.0	3.5
Other	64.1	35.5	0.3	71.0	28.7	0.2
Total, engineering	65.3	34.0	0.7	66.2	32.9	0.9
Science						
Physical	71.9	26.4	1.7	57.1	36.0	6.9
Math and computer	69.3	29.6	1.1	77.9	20.7	1.3
Environmental	72.2	27.2	0.6	56.9	42.0	1.1
Life	84.3	15.0	0.8	83.4	16.6	0.0
Psychology and social	82.7	16.4	0.9	80.5	19.5	0.0
Total, science	80.8	18.3	0.9	73.3	25.4	1.3
Other	0.0	85.7	14.3	0.0	96.2	3.8
Total	75.0	23.7	1.4	68.6	30.3	1.1

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table 37. Educational Attainment and Occupation: Total Versus Energy-Related 1972 Graduates in 1978

Occupation	Total			Energy-Related		
	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)
Engineering						
Chemical	54.5	33.9	11.6	48.3	45.3	6.4
Civil	65.2	32.4	2.3	42.6	52.0	5.4
Electrical or electronic	54.3	43.4	2.3	63.9	32.3	3.8
Mechanical	58.5	37.8	3.6	47.0	48.0	5.0
Nuclear, petroleum, or mining	56.5	35.5	8.0	58.3	33.7	8.1
Other	59.8	36.5	3.7	64.9	30.3	4.8
Total, engineering	58.5	37.6	3.9	56.5	37.8	5.7
Science						
Physical	35.5	37.0	27.5	22.7	34.8	42.5
Math and computer	53.4	41.4	5.2	59.8	36.4	3.9
Environmental	34.0	41.8	24.2	37.4	50.7	11.8
Life	50.3	31.0	18.7	19.2	67.0	13.8
Psychology and social	24.3	51.1	24.7	62.8	32.8	4.4
Total, science	40.4	41.4	18.2	40.4	43.0	16.6
Other	65.3	26.1	8.6	53.7	35.0	11.2
Total	58.1	31.8	10.1	52.2	38.6	9.2

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table 38. Educational Attainment and Occupation: Total Versus Energy-Related 1974-75 Graduates in 1976

	Total			Energy-Related		
Occupation	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)
Engineering						
Chemical	71.5	26.5	2.0	59.1	40.9	0.0
Civil	64.2	35.8	0.0	60.5	39.5	0.0
Electrical or electronic	66.3	32.4	1.3	63.3	36.7	0.0
Mechanical	80.2	19.0	0.7	81.8	18.2	0.0
Other[a]	67.4	32.1	0.5	61.5	36.9	1.6
Total, engineering	68.8	30.5	0.7	65.6	33.8	0.6
Science						
Physical	73.8	24.9	1.4	62.7	37.3	0.0
Environmental	61.5	38.5	0.0	45.5	54.5	0.0
Other[a]	67.8	29.4	2.7	66.8	33.2	0.0
Total, science	68.2	29.3	2.5	59.8	40.2	0.0
Other	88.6	11.0	0.4	80.1	19.9	0.0
Total	78.1	20.8	1.2	66.2	33.4	0.4

Source: Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147.

[a] The report from which this table is reproduced did not include separate information on life, social, math, and computer scientists, or on nuclear, petroleum, and mining engineers.

Table 39. Educational Attainment and Occupation: Total Versus Energy-Related 1976 Graduates in 1978

Occupation	Total			Energy-Related		
	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)	Bachelor's (Percent)	Master's (Percent)	Doctorate (Percent)
Engineering						
Chemical	67.8	30.4	1.8	59.9	38.0	2.1
Civil	69.1	30.9	0.0	62.8	37.2	0.0
Electrical or electronic	63.8	35.6	0.6	63.5	36.5	0.0
Mechanical	70.7	29.0	0.4	79.2	20.5	0.3
Nuclear, petroleum, or mining	69.7	27.0	3.3	66.3	31.2	2.5
Other	66.8	32.7	0.5	66.1	33.7	0.2
Total, engineering	67.4	31.9	0.8	68.2	30.9	0.9
Science						
Physical	68.0	29.8	2.2	63.5	30.4	6.0
Math and computer	62.4	36.8	0.8	70.4	27.9	1.7
Environmental	60.4	38.3	1.2	51.8	47.0	1.3
Life	73.4	25.0	1.7	55.8	44.2	0.0
Psychology and social	50.9	44.2	4.9	49.3	50.7	0.0
Total, science	63.0	34.6	2.4	58.5	39.2	2.2
Other	85.2	13.8	1.0	87.6	12.4	0.0
Total	74.9	23.7	1.4	68.6	30.3	1.1

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table 40. Comparison of 1976 and 1978 Survey: Percent Non-White, Total Versus Energy-Related Recent Graduates

Major	Total 1972 Graduates (Percent)	 1974-75 Graduates (Percent)	 1976 Graduates (Percent)	Energy-Related 1972 Graduates (Percent)	 1974-75 Graduates (Percent)	 1976 Graduates (Percent)
Science and engineering	5.1	6.5	6.6	6.5	2.4	4.9
Engineering	5.5	6.8	7.6	7.6	3.1	4.4
Science	5.0	6.4	6.3	5.0	1.0	5.4
Occupation						
Science and engineering	5.5	6.0	7.2	6.9	2.2	4.4
Engineering	5.3	6.5	7.2	8.1	2.3	4.1
Science	5.6	5.6	7.1	3.9	1.7	4.9

Source: 1974-75 Graduates column from Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147. 1972 and 1976 Graduates columns from Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: 1974-75 graduates surveyed in 1976; 1972 and 1976 graduates surveyed in 1978.

Table 41. Comparison of 1976 and 1978 Survey: Percent Female, Total Versus Energy-Related Graduates

Major	Total 1972 Graduates (Percent)	Total 1974-75 Graduates (Percent)	Total 1976 Graduates (Percent)	Energy-Related 1972 Graduates (Percent)	Energy-Related 1974-75 Graduates (Percent)	Energy-Related 1976 Graduates (Percent)
Science and engineering	21.6	29.1	29.2	6.0	8.3	13.5
Engineering	1.0	2.5	3.7	0.8	3.1	4.3
Science	27.6	35.0	35.6	13.3	19.5	23.7
Occupation						
Science and engineering	14.5	19.3	22.2	5.8	6.7	9.6
Engineering	2.7	3.4	6.2	2.1	3.7	5.5
Science	23.4	29.1	32.4	15.1	18.3	18.3

Source: 1974-75 Graduates column from Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147. 1972 and 1976 Graduates columns from Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: 1974-75 graduates surveyed in 1976; 1972 and 1976 graduates surveyed in 1978.

Table 42. Type of Employer by Occupation: Total Versus Energy-Related 1972 Graduates in 1978

Type of Employer	All Scientists and Engineers Total	All Scientists and Engineers Energy-Related	Engineers Total	Engineers Energy-Related	Scientists Total	Scientists Energy-Related
	(Percent)		(Percent)		(Percent)	
Private industry	55.2	82.5	76.6	87.2	36.6	70.6
Educational institution	18.2	5.3	2.7	1.4	31.6	15.0
Federal government	9.6	5.9	9.6	4.9	9.6	8.5
State and local government	8.7	2.1	6.3	1.6	10.8	3.4
Non-profit organization	2.8	2.7	1.7	3.0	3.7	2.0
Other	5.5	0.8	3.1	1.1	7.6	0.0
No answer	0.0	0.7	0.0	0.7	0.0	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table 43. Type of Employer by Occupation: Total Versus Energy-Related 1974-75 Graduates in 1976

Type of Employer	Scientists and Engineers		Engineers		Scientists	
	Total (Percent)	Energy-Related (Percent)	Total (Percent)	Energy-Related (Percent)	Total (Percent)	Energy-Related (Percent)
Private industry	46.1	78.1	73.2	81.4	29.2	65.6
Educational institution	20.4	10.3	7.0	7.4	28.8	21.4
Federal government	10.6	5.7	12.3	5.6	9.5	6.5
State and local government	11.1	2.1	5.3	2.1	14.8	1.9
Non-profit organization	10.0	2.2	1.3	1.5	15.4	4.7
Other	1.8	1.6	0.9	2.0	2.3	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147.

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table 44. Type of Employer by Occupation: Total Versus Energy-Related 1976 Graduates in 1978

Type of Employer	All Scientists and Engineers Total	 Energy-Related	Engineers Total	 Energy-Related	Scientists Total	 Energy-Related
	(Percent)		(Percent)		(Percent)	
Private industry	54.1	75.4	78.5	82.9	35.2	59.3
Educational institution	17.6	12.6	5.5	7.8	27.1	22.9
Federal government	7.6	5.7	7.8	5.0	7.5	7.0
State and local government	8.7	1.7	4.4	0.3	12.1	4.8
Non-profit organization	4.2	1.9	0.7	1.1	6.8	3.6
Other	7.7	0.6	3.0	0.5	11.4	1.1
No answer	0.0	2.1	0.0	2.5	0.0	2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table 45. Primary Work Activity by Occupation: Total Versus Energy-Related 1972 Graduates in 1978

Activity	Scientists and Engineers		Engineers		Scientists	
	Total	Energy-Related	Total	Energy-Related	Total	Energy-Related
	(Percent)		(Percent)		(Percent)	
Management	16.9	17.7	21.9	21.3	13.2	8.5
Teaching	8.1	2.2	1.6	1.7	13.1	3.3
Basic research	7.6	5.1	1.0	1.5	12.6	14.5
Applied research	6.6	9.0	4.0	6.8	8.6	14.7
Development	8.8	8.1	14.2	9.4	4.6	5.0
Report, technical writing	5.7	6.0	6.0	5.6	5.5	7.1
Design	7.1	12.6	15.3	17.1	1.0	1.1
Quality control	4.8	5.3	6.2	5.1	3.8	6.0
Operations	8.9	11.5	16.0	15.1	3.6	2.4
Distribution	2.0	1.7	1.7	2.4	2.2	0.0
Consulting	3.9	6.1	4.4	5.7	3.5	7.1
Other	18.6	14.6	7.1	8.4	27.2	30.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table 46. Primary Work Activity by Occupation: Total Versus Energy-Related 1974-75 Graduates in 1976

Activity	Scientists and Engineers		Engineers		Scientists	
	Total	Energy-Related	Total	Energy-Related	Total	Energy-Related
	(Percent)		(Percent)		(Percent)	
Management	12.5	8.8	13.9	9.2	11.5	7.4
Teaching	6.8	1.1	2.1	0.4	9.8	4.1
Basic research	11.1	6.6	3.8	4.9	15.7	13.6
Applied research	9.1	14.1	8.1	11.6	9.7	23.4
Development	10.8	10.9	14.5	10.3	8.5	13.2
Report, technical writing	2.0	1.6	1.3	0.8	2.4	4.6
Design	9.8	19.8	22.7	24.6	1.8	0.8
Quality control	6.1	6.8	7.4	6.2	5.4	9.0
Operations[a]	6.3	12.1	9.7	13.9	4.1	5.2
Sales, marketing, etc.	2.0	1.9	2.8	2.0	1.6	1.5
Consulting	3.9	5.8	4.2	6.2	3.6	4.6
Other	19.5	10.6	9.5	10.0	25.8	12.7
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147.

NOTE: Figures may not add to 100.0 percent due to independent rounding.

[a] Production in Rall report.

Table 47. Primary Work Activity by Occupation: Total Versus Energy-Related 1976 Graduates in 1978

Activity	All Scientists and Engineers		Engineers		Scientists	
	Total	Energy-Related	Total	Energy-Related	Total	Energy-Related
	(Percent)		(Percent)		(Percent)	
Management	11.0	11.8	12.3	14.5	10.3	6.2
Teaching	6.6	1.5	1.0	0.7	10.3	3.3
Basic research	9.4	7.3	1.9	2.5	14.2	17.3
Applied research	7.5	10.6	4.7	5.4	9.3	21.8
Development	7.9	8.0	13.7	9.1	4.3	5.7
Report, technical writing	8.1	6.4	8.3	7.0	8.0	5.1
Design	8.0	13.8	18.0	19.3	1.6	2.1
Quality control	7.2	6.8	9.8	7.6	5.5	5.1
Operations	9.9	14.3	17.1	20.4	5.2	1.5
Distribution	2.1	2.1	1.1	2.2	2.7	1.9
Consulting	2.6	3.6	3.7	4.8	1.9	1.1
Other	18.6	13.5	7.7	6.5	25.6	28.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

COMPARISON OF RECENT GRADUATES WITH THE EXPERIENCED WORK FORCE

The *1976 National Survey of Natural and Social Scientists and Engineers*, conducted for NSF by the Bureau of Census, sampled individuals who were identified as scientists or engineers in the 1970 Census of Population. Since they were in the work force in 1970, these individuals generally were older and had more experience than those in the Westat surveys (discussed earlier), who received their degrees in 1972 or later. The Census survey contained some questions comparable to questions asked in each of the Westat surveys. However, the wording of questions used in the Census survey differed somewhat from questions in the Westat surveys and only rough comparisons can be made. In addition, one must use care in comparing results from the 1978 Westat survey (of 1972 and 1976 graduates) with results from the survey of experienced workers conducted two years earlier, since answers given to a survey in 1978 might have been different than those recorded in 1976. The methods used to classify respondents as scientists or engineers also differed between the Census and Westat surveys.

The Westat samples were drawn from persons who received degrees in a science or engineering field. The Census sample included only persons who met a set of multiple criteria, including field of degree, occupation, and self-identification. As a result, many individuals may have been excluded from the Census survey who would have been included under the Westat criteria.[5]

MAJOR FIELD AND OCCUPATION

As shown in Table 48, recent[6] engineering graduates seem more likely than experienced engineering majors to be involved in energy-related activities. Differences are largest among civil and mechanical engineers, and appear to have increased between the 1976 and 1978 surveys. However, the difference may be overstated, since the data on experienced workers are for 1976 only. The proportion of energy-related experienced engineers may also have increased in those two years.

In the 1976 surveys, the percentage of new scientists whose work involved energy (3.4 percent) was smaller than the proportion of experienced energy-related scientists (8.9 percent in 1976). In 1978, the energy-related comprised up to 7.3 percent of recent graduates working as scientists, much closer to the proportion of energy-related experienced scientists reported two years earlier. Both new physical scientists and new environmental scientists were more involved in energy-related activities at the time of the 1978 survey than recent graduates had been two years earlier. However, the percentage of experienced environmental scientists working on energy concerns (48.9 in 1976) remained higher than the percentage of recent graduates in this category (33-34 percent).

Although the energy-related proportion of all new scientists and engineers increased from 4.6 percent of 1974-75 graduates to 8.3 percent of 1976 graduates, it remained below the 12.0 percent of experienced scientists and engineers who were energy-related. This can be at least partly explained by the large proportion of engineers (approximately 65 percent) in the experienced work force, and the small proportion of engineers among recent graduates (20 percent or less). As discussed earlier, engineers are more likely than scientists to work on energy problems.

Due to the differences in classification systems between the survey of experienced scientists and engineers and the surveys of recent graduates, comparisons must be made cautiously. Table 49 indicates that experienced science majors were more likely than recent graduates to be working as scientists. For engineering majors, the table suggests that experienced workers are less likely than recent graduates to be employed as engineers. However, the proportion of experienced workers whose work involves engineering is probably understated. In this table, a person who indicated "administration or management" as his or her occupation was not considered to be employed in either science or engineering, even if that person managed a science or engineering project. Since experienced workers are more likely than recent graduates to have indicated "administration or management" as an occupation, the proportion of experienced workers employed in science or engineering is more likely to be understated.

SEX AND RACE

According to the 1976 survey, non-whites comprised a smaller proportion of those working as scientists and engineers who graduated in 1974-75 (2.2 percent) than of experienced scientists and engineers (3.3 percent) (Table 50). In 1978, the proportion of non-white scientists and engineers had increased to 6.9 percent of 1972 graduates and 4.4 percent of 1976 graduates, indicating that non-white participation in energy-related activities increased between 1976 and 1978.

The proportion of females among all recent graduates was higher than the 1.0 percent among experienced workers (Table 51). This was especially true of 1976 graduates by occupation (9.6 percent female).

TYPE OF EMPLOYER

Table 52 compares energy-related recent graduates with energy-related experienced workers by type of employer. Recent graduates are more likely than experienced workers to be employed in educational institutions, but otherwise the two groups are similar. Six years after graduation, the pattern of 1972 engineers resembles that of the experienced engineers.

PRIMARY WORK ACTIVITY

Management and consulting activities are, predictably, more common to experienced workers than to recent graduates (Tables 53 through 55). However, engineers who graduated in 1972 are more likely than later graduates (though still less likely than experienced workers) to be involved in management. New engineers are more likely than experienced ones to work on applied research, quality control and operations. A higher percentage of new than experienced scientists are active in basic research, and a larger proportion of 1974 and later graduates seem to be working in applied research than of their more experienced counterparts.

Table 48. Percent Energy-Related: Recent Graduates Versus Experienced Workers

	Major				Occupation			
Field	1972 Graduates (Percent)	1974-75 Graduates (Percent)	1976 Graduates (Percent)	Experienced Workers (Percent)	1972 Graduates (Percent)	1974-75 Graduates (Percent)	1976 Graduates (Percent)	Experienced Workers (Percent)
Engineering								
Chemical	31.9	23.2	42.5	21.5	32.0	29.0	35.9	23.7
Civil	15.3	16.6	18.4	8.1	10.0	17.1	17.5	7.5
Electrical or electronic	14.5	14.3	14.1	11.3	13.8	18.5	14.4	12.0
Mechanical	31.5	24.5	34.7	16.5	40.0	31.4	37.5	18.8
Other	16.4	15.5	19.8	14.4	25.5	18.8	24.8	14.6
Total, engineering	19.3	17.5	22.1	13.6	23.3	21.0	24.5	14.3
Science								
Physical	10.8	4.3	11.5	8.4	15.4	6.5	18.0	7.4
Environmental	18.5	16.8	24.6	44.6	33.2	26.6	34.0	48.9
Other	2.7	1.3	3.8	3.3	3.7	2.0	4.1	3.4
Total, science	4.0	1.8	5.0	8.6	6.8	3.4	7.3	8.9
Other	4.2	0.4	3.4	8.9	2.0	1.4	2.6	9.4
Total	7.0	4.6	8.3	12.0	7.0	4.6	8.3	12.0

Source: 1974-75 Graduates and Experienced Workers columns from Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147. 1972 and 1976 Graduates columns from Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: The reader should remember that the 1974-75 graduates and experienced workers were surveyed in 1976, while the 1972 and 1976 graduates were surveyed in 1978.

Table 49. Comparison of Major Field of Study for Highest Degree Held and Occupation: Energy-Related Recent Graduates Versus Energy-Related Experienced Workers

Major	Percent with Occupation Similar to College Major			
	1972 Graduates in 1978 (Percent)	1974-75 Graduates in 1976 (Percent)	1976 Graduates in 1978 (Percent)	Experienced Workers in 1976 (Percent)
Science and engineering	75.4	79.9	73.4	74.3
Engineering	89.6	91.1	91.6	76.7
Science	55.2	55.5	53.1	64.7

Source: 1974-75 and Experienced Workers columns from Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147. 1972 and 1976 columns from Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: In this table, the science and engineering fields are not subdivided into specialty areas. All graduates are included if their occupation is in the same major (either science or engineering) in which they hold their highest degree.

Table 50. Percent Non-White: Energy-Related Recent Graduates Versus Energy-Related Experienced Workers

Major	Recent Graduates 1972 Graduates (Percent)	 1974-75 Graduates (Percent)	 1976 Graduates (Percent)	Experienced Workers in 1976 (Percent)
Science and engineering	6.5	2.4	4.9	2.9
Engineering	7.6	3.1	4.4	3.1
Science	5.0	1.0	5.4	2.3
Occupation				
Science and engineering	6.9	2.2	4.4	3.3
Engineering	8.1	2.3	4.1	3.3
Science	3.9	1.7	4.9	3.3

Source: 1974-75 Graduates and Experienced Workers columns from Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147. 1972 and 1976 Graduates columns from Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: The reader should remember that the 1972 and 1976 graduates were surveyed in 1978 and the 1974-75 graduates and experienced workers were surveyed in 1976.

Table 51. Percent Female: Energy-Related Recent Graduates Versus Energy-Related Experienced Workers

	Recent Graduates			
Major	1972 Graduates (Percent)	1974-75 Graduates (Percent)	1976 Graduates (Percent)	Experienced Workers (Percent)
Science and engineering	6.0	8.3	13.5	0.9
Engineering	0.8	3.1	4.3	0.2
Science	13.3	19.5	23.7	3.5
Occupation				
Science and engineering	5.8	6.7	9.6	1.0
Engineering	2.1	3.7	5.5	0.2
Science	15.1	18.3	18.3	4.3

Source: 1974-75 Graduates and Experienced Workers columns from Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147. 1972 and 1976 Graduates columns from Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

NOTE: The reader should remember that the 1972 and 1976 graduates were surveyed in 1978, and the 1974-75 graduates and experienced workers were surveyed in 1976.

Table 52. Type of Employer Versus Occupation: Energy-Related Recent Graduates Versus Energy-Related Experienced Workers

Type of Employer	Recent Graduates 1972 Graduates (Percent)	 1974-75 Graduates (Percent)	 1976 Graduates (Percent)	Experienced Workers (Percent)
	All Scientists and Engineers			
Private industry	82.5	78.1	75.4	80.2
Educational institution	5.3	10.3	12.6	2.4
Federal government	5.9	5.7	5.7	6.3
State and local government	2.1	2.1	1.7	2.6
Non-profit organization	2.7	2.2	1.9	1.8
Other	0.8	1.6	0.6	6.7
Total	100.0	100.0	100.0	100.0
	Engineers			
Private industry	87.2	81.4	82.9	82.2
Educational institution	1.4	7.4	7.8	2.4
Federal government	4.9	5.6	5.0	5.8
State and local government	1.6	2.1	0.3	2.5
Non-profit organization	3.0	1.5	1.1	1.6
Other	1.1	2.0	0.5	5.4
Total	100.0	100.0	100.0	100.0
	Scientists			
Private industry	70.6	65.6	59.3	71.5
Educational institution	15.0	21.4	22.9	2.6
Federal government	8.5	6.5	7.0	8.2
State and local government	3.4	1.9	4.8	3.1
Non-profit organization	2.0	4.7	3.6	2.4
Other	0.0	0.0	1.1	12.3
Total	100.0	100.0	100.0	100.0

Source: 1974-75 Graduates and Experienced Workers columns from Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147. 1972 and 1976 Graduates columns from Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

NOTES: The reader should remember that the 1972 and 1976 graduates were surveyed in 1978, and the 1974-75 graduates and experienced workers were surveyed in 1976.

Figures may not add to 100.0 percent due to independent rounding.

Table 53. Primary Work Activity of Scientists and Engineers: Energy-Related Recent Graduates Versus Energy-Related Experienced Workers

Primary Work Activity	Recent Graduates			
	1972 Graduates (Percent)	1974-75 Graduates (Percent)	1976 Graduates (Percent)	Experienced Workers (Percent)
Management	17.7	8.8	11.8	26.3
Teaching	2.2	1.1	1.5	0.7
Basic research	5.1	6.6	7.3	1.1
Applied research	9.0	14.1	10.6	5.4
Development	8.1	10.9	8.0	10.8
Report, technical writing	6.0	1.6	6.4	3.0
Design	12.6	19.8	13.8	15.6
Quality control	5.3	6.8	6.8	3.7
Operations	11.5	12.1	14.3	11.4
Distribution	1.7	1.9	2.1	2.9
Consulting	6.1	5.8	3.6	8.8
Other	14.6	10.6	13.5	10.4
Total	100.0	100.0	100.0	100.0

Source: 1974-75 Graduates and Experienced Workers columns from Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147. 1972 and 1976 Graduates columns from Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTES: The reader should remember that the 1972 and 1976 graduates were surveyed in 1978, and the 1974-75 graduates and experienced workers were surveyed in 1976.

Figures may not add to 100.0 percent due to independent rounding.

Table 54. Primary Work Activity of Engineers: Energy-Related Recent Graduates Versus Energy-Related Experienced Workers

Primary Work Activity	Recent Graduates: 1972 Graduates (Percent)	Recent Graduates: 1974-75 Graduates (Percent)	Recent Graduates: 1976 Graduates (Percent)	Experienced Workers (Percent)
Management	21.3	9.2	14.5	27.6
Teaching	1.7	0.4	0.7	0.6
Basic research	1.5	4.9	2.5	0.4
Applied research	6.8	11.6	5.4	3.1
Development	9.4	10.3	9.1	10.7
Report, technical writing	5.6	0.8	7.0	2.6
Design	17.1	24.6	19.3	18.8
Quality control	5.1	6.2	7.6	3.5
Operations	15.1	13.9	20.4	12.8
Distribution	2.4	2.0	2.2	3.4
Consulting	5.7	6.2	4.8	8.3
Other	8.4	10.0	6.5	8.2
Total	100.0	100.0	100.0	100.0

Source: 1974-75 Graduates and Experienced Workers columns from Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147. 1972 and 1976 Graduates columns from Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

NOTES: The reader should remember that the 1972 and 1976 graduates were surveyed in 1978, and the 1974-75 graduates and experienced workers were surveyed in 1976.

Figures may not add to 100.0 percent due to independent rounding.

Table 55. Primary Work Activity of Scientists: Energy-Related Recent Graduates Versus Energy-Related Experienced Workers

Primary Work Activity	Recent Graduates: 1972 Graduates (Percent)	Recent Graduates: 1974-75 Graduates (Percent)	Recent Graduates: 1976 Graduates (Percent)	Experienced Workers (Percent)
Management	8.5	7.4	6.2	20.6
Teaching	3.3	4.1	3.3	1.1
Basic research	14.5	13.6	17.3	4.5
Applied research	14.7	23.4	21.8	15.2
Development	5.0	13.2	5.7	11.1
Report, technical writing	7.1	4.6	5.1	4.7
Design	1.1	0.8	2.1	1.6
Quality control	6.0	9.0	5.1	4.7
Operations	2.4	5.2	1.5	5.1
Distribution	0.0	1.5	1.9	0.4
Consulting	7.1	4.6	1.1	10.9
Other	30.2	12.7	25.6	19.9
Total	100.0	100.0	100.0	100.0

Source: 1974-75 Graduates and Experienced Workers columns from Rall, Jane E., *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147. 1972 and 1976 Graduates columns from Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTES: The reader should remember that the 1972 and 1976 graduates were surveyed in 1978, and the 1974-75 graduates and experienced workers were surveyed in 1976.

Figures may not add to 100.0 percent due to independent rounding.

NOTES

[1] Jane E. Rall, *Energy-Related Scientists and Engineers: Statistical Profile of New Entrants into the Work Force, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, October 1978), ORAU-147.

[2] Michael G. Finn and Jane E. Rall, *Energy-Related Scientists and Engineers: Statistical Profile from the NSF National Sample, 1976* (Oak Ridge, Tennessee: Oak Ridge Associated Universities, May 1978), ORAU-143.

[3] Differences are discussed in Rall (1976).

[4] See Rall (1976).

[5] For further explanation, see Finn and Rall (1976).

[6] For convenience, "recent graduates" is used here to refer to the 1972, 1974, 1975, and 1976 graduates included in the Westat surveys. "Experienced" workers denotes those included in the Census survey.

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Table A-1. Detailed Major Field of Study for Highest Degree Held Versus Major Energy Source: Energy-Related 1972 Graduates in 1978[a]

Major	Energy Source: Coal and Coal Products	Percent	Petroleum	Percent	Natural Gas	Percent	Nuclear	Percent	Solar	Percent	Other	Percent
Engineering												
Chemical	446	11.4	416	5.8	287	10.1	165	3.9	60	3.0	41	1.9
Civil	390	10.0	395	5.6	102	3.6	279	6.6	34	1.7	116	5.4
Electrical or electronic	514	13.2	358	5.0	140	4.9	331	7.9	280	13.9	511	23.8
Mechanical	896	23.0	590	8.3	392	13.9	739	17.6	259	12.8	320	14.9
Nuclear, petroleum, or mining	157	4.0	403	5.7	191	6.8	805	19.2	11	0.6	22	1.0
Other	418	10.7	739	10.4	295	10.4	346	8.2	93	4.6	123	5.7
Total, engineering	2,821	72.3	2,901	40.7	1,407	49.8	2,665	63.5	737	36.4	1,133	52.8
Science												
Physical	243	6.2	375	5.3	125	4.4	468	11.1	342	16.9	162	7.5
Math and computer	393	10.1	533	7.5	60	2.1	217	5.2	0	0.0	171	7.9
Environmental	175	4.5	689	9.7	360	12.8	185	4.4	66	3.3	145	6.7
Life	126	3.2	670	9.4	274	9.7	128	3.0	513	25.3	46	2.2
Psychology and social	0	0.0	725	10.2	415	14.7	440	10.5	365	18.0	53	2.5
Total, science	937	24.0	2,992	42.1	1,234	43.7	1,438	34.2	1,286	63.5	577	26.9
Other	145	3.7	1,226	17.2	184	6.5	98	2.3	0	0.0	436	20.3
Total	3,903	100.0	7,122	100.0	2,826	100.0	4,199	100.0	2,024	100.0	2,147	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-2. Detailed Major Field of Study for Highest Degree Held Versus Major Energy Source: 1976 Graduates in 1978[a]

Major	Energy Source											
	Coal and Coal Products	Percent	Petroleum	Percent	Natural Gas	Percent	Nuclear	Percent	Solar	Percent	Other	Percent
Engineering												
Chemical	305	7.2	914	11.7	292	7.7	62	1.2	100	6.1	144	6.9
Civil	409	9.7	559	7.1	211	5.6	419	8.0	105	6.4	137	6.6
Electrical or electronic	346	8.2	709	9.0	206	5.4	321	6.1	36	2.2	235	11.3
Mechanical	647	15.3	764	9.7	625	16.5	696	13.3	327	19.9	111	5.4
Nuclear, petroleum, or mining	234	5.5	492	6.3	47	1.2	690	13.2	0	0.0	79	3.8
Other	313	7.4	635	8.1	727	19.2	614	11.7	206	12.5	280	13.5
Total, engineering	2,254	53.4	4,073	51.9	2,108	55.5	2,802	53.4	774	47.2	986	47.5
Science												
Physical	249	5.9	223	2.8	116	3.1	566	10.8	211	12.9	166	8.0
Math and computer	253	6.0	913	11.6	236	6.2	86	1.6	174	10.6	129	6.2
Environmental	307	7.3	804	10.3	432	11.4	490	9.3	97	5.9	42	2.0
Life	339	8.0	883	11.3	83	2.2	513	9.8	160	9.7	436	21.0
Psychology and social	793	18.8	689	8.8	778	20.5	764	14.5	211	12.9	316	15.2
Total, science	1,941	46.0	3,512	44.8	1,645	43.3	2,419	46.1	853	52.0	1,089	52.4
Other	29	0.7	259	3.3	41	1.1	30	0.6	14	0.9	0	0.0
Total	4,224	100.0	7,842	100.0	3,795	100.0	5,251	100.0	1,641	100.0	2,077	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-3. Detailed Occupation Versus Major Energy Source Involved in Energy-Related Activities: Energy-Related 1972 Graduates in 1978[a]

Occupation	Energy Source Coal and Coal Products	Percent	Petroleum	Percent	Natural Gas	Percent	Nuclear	Percent	Solar	Percent	Other	Percent
Engineering												
Chemical	192	4.9	334	4.7	173	6.1	165	3.9	33	1.8	41	1.9
Civil	185	4.7	184	2.6	24	0.8	202	4.8	13	0.8	82	3.8
Electrical or electronic	538	13.8	206	2.9	158	5.6	174	4.2	108	6.1	440	20.5
Mechanical	596	15.3	1,236	17.4	374	13.2	637	15.2	270	15.2	16	0.7
Nuclear, petroleum, or mining	331	8.5	868	12.2	499	17.6	1,588	37.8	11	0.6	83	3.9
Other	808	20.7	958	13.5	316	11.2	383	9.1	318	17.9	485	22.6
Total, engineering	2,650	67.9	3,786	53.4	1,544	54.6	3,149	75.0	753	42.4	1,147	53.4
Science												
Physical	176	4.5	381	5.4	102	3.6	385	9.2	159	9.0	66	3.1
Math and computer	185	4.7	454	6.4	29	1.0	203	4.8	295	16.6	95	4.4
Environmental	92	2.4	772	10.9	342	12.1	228	5.4	66	3.7	145	6.7
Life	162	4.2	70	1.0	0	0.0	14	0.3	252	14.2	40	1.8
Psychology and social	24	0.6	188	2.6	206	7.3	10	0.2	18	1.0	181	8.4
Total, science	639	16.4	1,865	26.3	679	24.0	840	20.0	790	44.5	527	24.5
Other	614	15.7	1,442	20.3	603	21.3	210	5.0	232	13.1	474	22.1
Total	3,903	100.0	7,094	100.0	2,826	100.0	4,199	100.0	1,775	100.0	2,147	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-4. Detailed Occupation Versus Major Energy Source Involved in Energy-Related Activities: Energy-Related 1976 Graduates in 1978

Occupation	Energy Source											
	Coal and Coal Products	Percent	Petroleum	Percent	Natural Gas	Percent	Nuclear	Percent	Solar	Percent	Other	Percent
Engineering												
Chemical	226	5.3	689	8.8	252	6.7	76	1.4	114	6.9	191	9.2
Civil	324	7.7	322	4.1	143	3.8	475	9.0	69	4.2	127	6.1
Electrical or electronic	514	12.2	477	6.1	170	4.5	308	5.9	48	2.9	206	9.9
Mechanical	531	12.6	1,125	14.4	847	22.3	755	14.4	401	24.4	123	5.9
Nuclear, petroleum, or mining	279	6.6	1,438	18.3	472	12.4	955	18.2	0	0.0	28	1.4
Other	557	13.2	612	7.8	504	13.3	568	10.8	327	19.9	280	13.5
Total, engineering	2,431	57.6	4,663	59.5	2,388	62.9	3,137	59.7	959	58.4	955	46.0
Science												
Physical	380	9.0	210	2.7	81	2.1	624	11.9	193	11.8	274	13.2
Math and computer	78	1.9	782	10.0	174	4.6	89	1.7	54	3.3	129	6.2
Environmental	273	6.5	710	9.1	312	8.2	461	8.8	77	4.7	34	1.6
Life	63	1.5	32	0.4	0	0.0	91	1.7	157	9.6	205	9.9
Psychology and social	144	3.4	447	5.7	42	1.1	0	0.0	65	4.0	86	4.2
Total, science	938	22.2	2,181	27.8	609	16.0	1,265	24.1	546	33.3	728	35.1
Other	855	20.2	995	12.7	797	21.0	849	16.2	137	8.3	393	18.9
Total	4,224	100.0	7,842	100.0	3,795	100.0	5,251	100.0	1,641	100.0	2,077	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-5. Major Energy Source Involved in Energy-Related Activities Versus Highest Degree Held: Energy-Related 1972 Graduates in 1978

	Highest Degree Held			
Energy Source	Bachelor's	Percent	Master's or Doctorate	Percent
Coal, coal products	2,315	59.3	1,588	40.7
Petroleum	3,290	46.2	3,831	53.8
Natural gas	2,081	73.6	745	26.3
Nuclear[a]	2,243	53.4	1,956	46.6
Solar	1,012	50.0	1,012	50.0
Other	440	20.5	1,708	79.5
No data	940	81.0	220	19.1
Total	12,322	52.7	11,061	47.3

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

NOTE: Figures may not add to totals due to independent rounding.

[a] Includes fission and fusion.

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Table A-6. Major Energy Source Involved in Energy-Related Activities Versus Highest Degree Held: Energy-Related 1976 Graduates in 1978

	Highest Degree Held			
Energy Source	Bachelor's	Percent	Master's or Doctorate	Percent
Coal, coal products	3,030	71.7	1,194	28.2
Petroleum	5,718	72.9	2,123	27.0
Natural gas	2,881	75.9	914	24.1
Nuclear[a]	3,505	66.8	1,746	33.3
Solar	891	54.3	750	45.7
Other	1,398	67.3	679	32.7
No data	490	37.9	804	62.1
Total	17,913	68.6	8,210	31.4

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

NOTE: Figures may not add to totals due to independent rounding.

[a] Includes fission and fusion.

Table A-7. Type of Employer Versus Major Energy Source Involved in Energy-Related Activities: Energy-Related 1972 Graduates in 1978[a]

	Energy Source													
Employer	Coal, Coal Products	Percent	Petroleum	Percent	Natural Gas	Percent	Nuclear	Percent	Solar	Percent	Other	Percent	No Data	Percent
Private industry	3,462	89.0	6,636	93.2	2,669	94.4	3,043	73.5	1,213	59.9	1,207	57.7	731	63.0
Education	84	2.2	187	2.6	0	0.0	244	5.9	509	25.1	167	8.0	43	3.7
All government (civilian)	263	6.7	192	2.7	128	4.5	418	10.1	117	5.8	401	19.1	340	29.3
Other	81	2.1	107	1.4	29	1.0	432	10.4	185	9.2	318	15.2	46	4.0
Total	3,890	100.0	7,121	100.0	2,826	100.0	4,138	100.0	2,024	100.0	2,092	100.0	1,161	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-8. Type of Employer Versus Major Energy Source Involved in Energy-Related Activities: Energy-Related 1976 Graduates in 1978[a]

Employer	Energy Source													
	Coal, Coal Products	Percent	Petroleum	Percent	Natural Gas	Percent	Nuclear	Percent	Solar	Percent	Other	Percent	No Data	Percent
Private industry	3,169	78.5	6,839	87.7	2,873	83.2	3,339	63.6	683	42.7	1,460	71.7	769	59.4
Education	448	11.1	475	6.1	110	3.2	667	12.7	613	38.3	309	15.2	313	24.2
All government (civilian)	265	6.6	482	6.2	469	13.6	504	9.6	105	6.5	180	8.8	189	14.6
Other	157	3.9	0	0.0	0	0.0	742	14.1	200	12.5	88	4.3	23	1.8
Total	4,039	100.0	7,796	100.0	3,452	100.0	5,251	100.0	1,601	100.0	2,036	100.0	1,295	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-9. Annual Salary Versus Major Energy Source: Energy-Related 1972 Graduates in 1978[a]

Salary (Dollars)	Energy Source Coal, Coal Products	Percent	Petroleum	Percent	Natural Gas	Percent	Nuclear	Percent	Solar	Percent	Other	Percent
10,000 or less	44	1.3	142	2.1	0	0.0	225	6.2	179	11.8	82	3.9
10,100 to 15,000	137	3.9	210	3.0	404	15.2	264	7.3	353	23.0	113	5.4
15,100 to 20,000	1,163	33.6	1,555	22.5	581	21.8	802	22.3	533	34.7	434	20.8
20,100 to 25,000	1,389	40.1	2,739	39.6	990	37.2	1,554	43.2	376	24.5	949	45.5
25,100 to 30,000	640	18.5	1,458	21.1	507	19.0	517	14.4	37	2.4	261	12.5
Over 30,000	90	2.6	804	11.6	182	6.8	239	6.6	55	3.6	247	11.8
Total	3,463	100.0	6,908	100.0	2,665	100.0	3,600	100.0	1,534	100.0	2,086	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

NOTE: Figures may not add to totals due to independent rounding.

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[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-10. Annual Salary Versus Major Energy Source: Energy-Related 1976 Graduates in 1978[a]

	Energy Source											
Salary (Dollars)	Coal, Coal Products	Percent	Petroleum	Percent	Natural Gas	Percent	Nuclear	Percent	Solar	Percent	Other	Percent
10,000 or less	359	9.0	432	6.0	560	15.1	1,057	21.4	491	31.8	285	16.2
10,100 to 15,000	757	19.1	1,327	18.2	655	17.6	1,010	20.5	350	22.7	477	27.3
15,100 to 20,000	2,031	51.2	3,060	42.0	1,259	33.9	2,102	42.6	475	30.8	585	33.4
20,100 to 25,000	758	19.1	1,788	24.5	671	18.0	502	10.2	191	12.4	251	14.4
25,100 to 30,000	48	1.2	434	6.0	430	11.6	201	4.1	0	0.0	111	6.4
Over 30,000	13	0.3	246	3.4	142	3.8	62	1.3	36	2.3	39	2.2
Total	3,965	100.0	7,287	100.0	3,717	100.0	4,934	100.0	1,542	100.0	1,748	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineeri* *Graduates*.

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-11. Major Field of Study for Highest Degree Held Versus Major Energy-Related Activity: Energy-Related 1972 Graduates in 1978[a]

	Energy-Related Activity							
Major	Exploration	Extraction	Manufacturing or Processing	Generation	Transportation or Storage	Conservation	Environmental Impact	Other
Engineering								
Chemical	0	93	528	46	38	136	70	170
Civil	40	55	147	405	157	55	34	120
Electrical or electronic	173	35	349	391	845	153	10	296
Mechanical	0	163	806	594	272	482	0	554
Nuclear, petroleum, or mining	110	393	250	353	24	89	106	102
Other	55	440	454	259	145	214	11	328
Total, engineering	378	1,179	2,534	2,048	1,481	1,129	231	1,570
Science								
Physical	41	45	464	171	31	104	41	397
Math and computer	489	0	179	65	33	32	36	268
Environmental	1,050	153	27	36	27	27	126	106
Life	67	272	316	189	81	105	210	304
Psychology and social	0	0	158	105	188	272	53	959
Total, science	1,663	470	1,144	566	360	540	466	2,034
Other	16	0	254	89	122	46	116	576
Total	2,040	1,649	3,932	2,702	1,963	1,714	813	4,180

Table A-11. Major Field of Study for Highest Degree Held Versus Major Energy-Related Activity: Energy-Related 1972 Graduates in 1978[a] (Continued)

Major	Energy-Related Activity							
	Exploration (Percent)	Extraction (Percent)	Manufacturing or Processing (Percent)	Generation (Percent)	Transportation or Storage (Percent)	Conservation (Percent)	Environmental Impact (Percent)	Other (Percent)
Engineering								
Chemical	0.0	5.6	13.4	1.7	1.9	7.9	8.7	4.1
Civil	1.9	3.3	3.7	15.0	8.0	3.2	4.2	2.9
Electrical or electronic	8.5	2.1	8.9	14.5	43.0	8.9	1.3	7.1
Mechanical	0.0	9.9	20.5	22.0	13.9	28.1	0.0	13.3
Nuclear, petroleum, or mining	5.4	23.8	6.3	13.1	1.2	5.2	13.0	2.4
Other	2.7	26.7	11.5	9.6	7.4	12.5	1.4	7.8
Total, engineering	18.5	71.5	64.4	75.8	75.4	65.9	28.4	37.6
Science								
Physical	2.0	2.7	11.8	6.3	1.6	6.1	5.0	9.5
Math and computer	24.0	0.0	4.6	2.4	1.7	1.8	4.4	6.4
Environmental	51.5	9.3	0.7	1.3	1.4	1.6	15.5	2.5
Life	3.3	16.5	8.0	7.0	4.1	6.1	25.8	7.3
Psychology and social	0.0	0.0	4.0	3.9	9.6	15.9	6.5	22.9
Total, science	80.8	28.5	29.1	20.9	18.3	31.5	57.3	48.7
Other	0.8	0.0	6.5	3.3	6.2	2.7	14.2	13.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-12. Major Field of Study for Highest Degree Held Versus Major Energy-Related Activity: Energy-Related 1976 Graduates in 1978[a]

Major	Energy-Related Activity							
	Exploration	Extraction	Manufacturing or Processing	Generation	Transportation or Storage	Conservation	Environmental Impact	Other
Engineering								
Chemical	11	127	552	11	54	350	55	217
Civil	72	189	258	512	221	75	60	184
Electrical or electronic	113	72	172	317	386	194	29	478
Mechanical	130	127	813	676	278	501	93	253
Nuclear, petroleum, or mining	99	464	135	374	0	16	99	176
Other	99	140	388	258	452	459	203	334
Total, engineering	524	1,119	2,318	2,148	1,391	1,595	549	1,642
Science								
Physical	62	129	257	240	98	71	36	482
Math and computer	345	67	163	40	224	62	38	330
Environmental	1,306	178	137	59	12	80	71	147
Life	455	156	167	80	50	80	387	624
Psychology and social	42	0	395	74	366	443	367	1,137
Total, science	2,210	530	1,119	493	750	736	899	2,720
Other	19	0	46	9	29	131	0	98
Total	2,753	1,650	3,483	2,651	2,171	2,462	1,447	4,460

Table A-12. Major Field of Study for Highest Degree Held Versus Major Energy-Related Activity; Energy-Related 1976 Graduates in 1978[a] (Continued)

Major	Exploration (Percent)	Extraction (Percent)	Manufacturing or Processing (Percent)	Generation (Percent)	Transportation or Storage (Percent)	Conservation (Percent)	Environmental Impact (Percent)	Other (Percent)
	Energy-Related Activity							
Engineering								
Chemical	0.4	7.7	15.9	0.4	2.5	14.2	4.5	4.9
Civil	2.6	11.4	7.4	19.3	10.2	3.1	4.1	4.1
Electrical or electronic	4.1	4.4	4.9	12.0	17.8	7.9	2.0	10.7
Mechanical	4.7	7.7	23.3	25.5	12.8	20.4	6.4	5.7
Nuclear, petroleum, or mining	3.6	28.1	3.9	14.1	0.0	0.7	6.8	3.9
Other	3.6	8.5	11.1	9.7	20.8	18.6	14.0	7.5
Total, engineering	19.0	67.8	66.6	81.0	64.1	64.8	37.9	36.8
Science								
Physical	2.3	7.8	7.4	9.1	4.5	2.9	2.5	10.8
Math and computer	12.5	4.0	4.7	1.5	10.3	2.5	2.6	7.4
Environmental	47.4	10.8	3.9	2.2	0.6	3.3	4.9	3.3
Life	16.5	9.5	4.8	3.0	2.3	3.3	26.7	14.0
Psychology and social	1.5	0.0	11.3	2.8	16.9	18.0	25.3	25.5
Total, science	80.3	32.1	32.1	18.6	34.5	29.9	62.1	61.0
Other	0.7	0.0	1.3	0.4	1.3	5.3	0.0	2.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-13. Detailed Occupation Versus Major Energy-Related Activity: Energy-Related 1972 Graduates in 1978[a]

	Energy-Related Activity							
Occupation	Exploration	Extraction	Manufacturing or Processing	Generation	Transportation or Storage	Conservation	Environmental Impact	Other
Engineering								
Chemical	0	60	415	19	19	106	38	189
Civil	29	44	124	270	86	13	31	31
Electrical or electronic	122	0	148	276	733	130	0	182
Mechanical	0	104	615	578	167	452	36	553
Nuclear, petroleum, or mining	205	846	510	471	131	137	225	574
Other	61	296	764	316	279	314	46	515
Total, engineering	417	1,350	2,576	1,930	1,415	1,152	376	2,044
Science								
Physical	0	62	258	263	0	27	41	296
Math and computer	375	18	126	152	35	0	0	529
Environmental	1,162	122	0	36	27	27	27	122
Life	0	0	33	27	0	129	198	150
Psychology and social	27	0	0	0	206	0	77	216
Total, science	1,564	202	417	478	268	183	343	1,313
Other	59	96	690	292	253	377	94	823
Total	2,040	1,649	3,683	2,702	1,936	1,714	813	4,180

Table A-13. Detailed Occupation Versus Major Energy-Related Activity: Energy-Related 1972 Graduates in 1978[a] (Continued)

	Energy-Related Activity							
	Exploration (Percent)	Extraction (Percent)	Manufacturing or Processing (Percent)	Generation (Percent)	Transportation or Storage (Percent)	Conservation (Percent)	Environmental Impact (Percent)	Other (Percent)
Engineering								
Chemical	0.0	3.6	11.3	0.7	1.0	6.2	4.6	4.5
Civil	1.4	2.7	3.4	10.0	4.4	0.8	3.8	0.7
Electrical or electronic	6.0	0.0	4.0	10.2	37.9	7.6	0.0	4.4
Mechanical	0.0	6.3	16.7	21.4	8.6	26.4	4.4	13.2
Nuclear, petroleum, or mining	10.1	51.3	13.8	17.4	6.8	8.0	27.7	13.7
Other	3.0	18.0	20.7	11.7	14.4	18.3	5.7	12.3
Total, engineering	20.4	81.9	70.0	71.4	73.1	67.2	46.2	48.9
Science								
Physical	0.0	3.8	7.0	9.7	0.0	1.6	5.0	7.1
Math and computer	18.4	1.1	3.4	5.6	1.8	0.0	0.0	12.7
Environmental	57.0	7.4	0.0	1.3	1.4	1.6	3.4	2.9
Life	0.0	0.0	0.9	1.0	0.0	7.5	24.3	3.6
Psychology and social	1.3	0.0	0.0	0.0	10.6	0.0	9.5	5.2
Total, science	76.7	12.2	11.3	17.7	13.8	10.7	42.2	31.4
Other	2.9	5.8	18.7	10.8	13.1	22.0	11.6	19.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-14. Detailed Occupation Versus Major Energy-Related Activity: Energy-Related 1976 Graduates in 1978[a]

Occupation	Energy-Related Activity							
	Exploration	Extraction	Manufacturing or Processing	Generation	Transportation or Storage	Conservation	Environmental Impact	Other
Engineering								
Chemical	48	22	488	36	14	350	64	259
Civil	98	102	294	441	176	0	34	127
Electrical or electronic	91	43	122	352	427	135	29	348
Mechanical	0	39	851	715	279	704	80	287
Nuclear, petroleum, or mining	509	993	371	377	118	25	99	388
Other	37	86	599	327	336	316	417	534
Total, engineering	783	1,285	2,725	2,248	1,350	1,530	723	1,943
Science								
Physical	131	48	452	137	98	47	120	462
Math and computer	340	69	90	32	204	38	38	281
Environmental	1,228	169	125	0	0	12	73	97
Life	83	11	0	0	24	91	173	257
Psychology and social	0	20	0	82	42	519	144	375
Total, science	1,782	317	667	251	368	707	548	1,472
Other	188	48	91	152	453	224	176	1,045
Total	2,753	1,650	3,483	2,651	2,171	2,462	1,447	4,460

Table A-14. Detailed Occupation Versus Major Energy-Related Activity: Energy-Related 1976 Graduates in 1978[a] (Continued)

Occupation	Energy-Related Activity							
	Exploration (Percent)	Extraction (Percent)	Manufacturing or Processing (Percent)	Generation (Percent)	Transportation or Storage (Percent)	Conservation (Percent)	Environmental Impact (Percent)	Other (Percent)
Engineering								
Chemical	1.7	1.3	14.0	1.4	0.6	14.2	4.4	5.8
Civil	3.6	6.2	8.4	16.6	8.1	0.0	2.4	2.8
Electrical or electronic	3.3	2.6	3.5	13.3	19.7	5.5	2.0	7.8
Mechanical	0.0	2.4	24.4	27.0	12.8	28.6	5.5	6.4
Nuclear, petroleum, or mining	18.5	60.2	10.6	14.2	5.4	1.0	6.8	8.7
Other	1.3	5.2	17.2	12.3	15.5	12.8	28.8	12.0
Total, engineering	28.4	77.9	78.2	84.8	62.2	62.1	50.0	43.6
Science								
Physical	4.8	2.9	13.0	5.2	4.5	1.9	8.3	10.4
Math and computer	12.3	4.2	2.6	1.2	9.4	1.5	2.6	6.3
Environmental	44.6	10.2	3.6	0.0	0.0	0.5	5.0	2.2
Life	3.0	0.7	0.0	0.0	1.1	3.7	12.0	5.8
Psychology and social	0.0	1.2	0.0	3.1	1.9	21.1	10.0	8.4
Total, science	64.7	19.2	19.2	9.5	17.0	28.7	37.9	33.0
Other	6.8	2.9	2.6	5.7	20.0	9.1	12.2	23.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-15. Primary Work Activity Versus Major Energy-Related Activity: Energy-Related 1972 Graduates in 1978[a]

Work Activity	Energy-Related Activity							
	Exploration	Extraction	Manufacturing or Processing	Generation	Transportation or Storage	Conservation	Environmental Impact	Other
Management	180	382	659	554	393	475	70	762
Teaching	0	14	33	0	0	189	0	270
Basic research	102	61	66	134	27	109	98	340
Applied research	503	99	115	153	96	16	60	546
Development	200	161	435	108	13	209	23	188
Report, technical writing	80	19	304	255	87	85	229	92
Design	0	289	651	369	355	127	10	287
Quality control	118	30	255	256	214	84	19	0
Operations	198	384	699	515	374	133	50	187
Distribution	0	87	412	64	0	46	20	320
Consulting	110	89	36	88	357	160	161	126
Other	550	34	267	208	45	81	73	1,061
Total	2,040	1,649	3,932	2,702	1,963	1,714	813	4,180

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-16. Primary Work Activity Versus Major Energy-Related Activity: Energy-Related 1976 Graduates in 1978[a]

Work Activity	Energy-Related Activity							
	Exploration	Extraction	Manufacturing or Processing	Generation	Transportation or Storage	Conservation	Environmental Impact	Other
Management	267	127	288	475	188	246	13	705
Teaching	54	0	38	12	0	55	58	170
Basic research	232	34	319	153	66	224	194	297
Applied research	474	133	151	164	169	283	139	500
Development	265	136	512	115	26	157	9	317
Report, technical writing	227	91	92	230	84	147	381	394
Design	93	149	686	493	475	385	61	350
Quality control	240	97	309	325	40	34	149	381
Operations	326	607	578	437	496	218	79	260
Distribution	93	12	299	11	181	108	111	43
Consulting	44	20	27	102	82	83	92	197
Other	419	245	184	134	364	424	67	517
Total	2732	1650	3483	2651	2171	2462	1447	4453

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

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[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-17. Annual Salary Versus Major Energy-Related Activity: Energy-Related 1972 Graduates in 1978[a]

Annual Salary (Dollars)	Energy-Related Activity							
	Exploration	Extraction	Manufacturing or Processing	Generation	Transportation or Storage	Conservation	Environmental Impact	Other
10,000 or less	116	30	56	97	16	103	0	227
10,100 to 15,000	116	0	221	208	13	107	68	322
15,100 to 20,000	299	251	963	528	541	463	385	1,245
20,100 to 25,000	906	604	1,431	1,033	1,004	806	225	1,379
25,100 to 30,000	330	448	457	551	273	148	74	520
Over 30,000	257	214	160	179	90	57	27	72
Total	2,023	1,548	3,288	2,596	1,936	1,684	780	3,764

Annual Salary (Dollars)	Exploration (Percent)	Extraction (Percent)	Manufacturing or Processing (Percent)	Generation (Percent)	Transportation or Storage (Percent)	Conservation (Percent)	Environmental Impact (Percent)	Other (Percent)
10,000 or less	5.7	1.9	1.7	3.7	0.8	6.1	0.0	6.0
10,100 to 15,000	5.7	0.0	6.7	8.0	0.7	6.4	8.7	8.5
15,100 to 20,000	14.8	16.2	29.3	20.3	27.9	27.5	49.4	33.1
20,100 to 25,000	44.8	39.0	43.5	39.8	51.9	47.9	28.9	36.6
25,100 to 30,000	16.3	29.0	13.9	21.2	14.1	8.8	9.5	13.8
Over 30,000	12.7	13.8	4.9	6.9	4.6	3.4	3.5	1.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-18. Annual Salary Versus Major Energy-Related Activity: Energy-Related 1976 Graduates in 1978[a]

	Energy-Related Activity							
Annual Salary (Dollars)	Exploration	Extraction	Manufacturing or Processing	Generation	Transportation or Storage	Conservation	Environmental Impact	Other
10,000 or less	72	121	375	154	149	237	206	738
10,100 to 15,000	714	120	672	215	460	597	518	1,116
15,100 to 20,000	1,050	527	1,479	1,530	974	912	531	1,451
20,100 to 25,000	725	664	659	414	347	423	121	523
25,100 to 30,000	114	102	97	191	111	62	0	152
Over 30,000	0	48	105	67	78	0	0	77
Total	2,676	1,582	3,387	2,571	2,117	2,231	1,375	4,056

Annual Salary (Dollars)	Exploration (Percent)	Extraction (Percent)	Manufacturing or Processing (Percent)	Generation (Percent)	Transportation or Storage (Percent)	Conservation (Percent)	Environmental Impact (Percent)	Other (Percent)
10,000 or less	2.7	7.6	11.1	6.0	7.0	10.6	15.0	18.2
10,100 to 15,000	26.7	7.6	19.8	8.4	21.7	26.7	37.6	27.5
15,100 to 20,000	39.2	33.3	43.7	59.5	46.0	40.9	38.6	35.8
20,100 to 25,000	27.1	42.0	19.5	16.1	16.4	19.0	8.8	12.9
25,100 to 30,000	4.3	6.5	2.9	7.4	5.2	2.8	0.0	3.8
Over 30,000	0.0	3.1	3.1	2.6	3.7	0.0	0.0	1.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-19. Major Field of Study for Highest Degree Held Versus Time Spent on Energy-Related Activities: Energy-Related 1972 Graduates in 1978

	Percent of Time Spent on Energy-Related Activities				
Major	100	75-99	50-74	25-49	24 or Less
	(Percent of Graduates)				
Engineering					
Chemical	56.4	9.8	10.6	8.1	15.0
Civil	64.1	8.8	9.3	6.5	11.2
Electrical or electronic	55.3	13.8	12.2	8.1	10.6
Mechanical	57.8	12.5	12.1	6.5	11.1
Nuclear, petroleum, or mining	80.5	6.5	1.1	4.3	7.5
Other	57.6	6.1	17.2	10.7	8.3
Total, engineering	60.8	10.2	11.1	7.5	10.4
Science					
Physical	40.5	11.7	21.3	6.9	19.7
Math and computer	68.7	13.5	9.7	0.0	8.1
Environmental	74.2	5.8	5.6	6.6	7.8
Life	58.6	10.4	8.0	18.0	5.0
Psychology and social	52.8	10.4	6.8	15.0	15.0
Total, science	58.6	10.1	10.0	10.1	11.2
Other	29.5	26.9	19.0	10.9	13.7
Total	58.0	11.2	11.2	8.7	10.9

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table A-20. Major Field of Study for Highest Degree Held Versus Time Spent on Energy-Related Activities: Energy-Related 1976 Graduates in 1978

Major	Percent of Time Spent on Energy-Related Activities				
	100	75-99	50-74	25-49	24 or Less
	(Percent of Graduates)				
Engineering					
Chemical	43.4	9.1	14.7	15.1	17.7
Civil	69.4	16.0	6.4	4.2	4.0
Electrical or electronic	40.7	12.9	18.8	10.7	16.9
Mechanical	57.0	12.8	9.3	12.1	8.9
Nuclear, petroleum, or mining	76.1	9.4	5.4	3.3	5.9
Other	50.0	20.0	8.1	12.5	9.5
Total, engineering	55.3	13.9	10.3	10.2	10.3
Science					
Physical	48.6	17.2	13.1	6.0	15.1
Math and computer	69.8	7.9	11.4	4.8	6.1
Environmental	74.0	13.1	2.8	4.3	5.9
Life	52.0	7.8	30.7	9.5	0.0
Psychology and social	46.2	18.4	23.8	1.1	10.5
Total, science	56.8	13.5	17.6	4.8	7.5
Other	92.2	7.8	0.0	0.0	0.0
Total	56.5	13.6	13.4	7.6	8.9

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

Table A-21. Occupation Versus Time Spent on Energy-Related Activities: Energy-Related 1972 Graduates in 1978

	Percent of Time Spent on Energy-Related Activities				
Occupation	100	75-99	50-74	25-49	24 or Less
		(Percent of Graduates)			
Engineering					
Chemical	54.0	8.7	14.5	8.1	14.7
Civil	65.9	9.7	12.2	4.8	7.4
Electrical or electronic	50.6	8.5	14.6	9.8	16.6
Mechanical	62.1	14.1	7.2	7.2	9.5
Nuclear, petroleum, or mining	83.9	7.3	1.6	2.8	4.5
Other	60.9	11.0	8.0	8.9	11.2
Total, engineering	65.9	10.0	7.7	6.6	9.8
Science					
Physical	46.9	16.9	13.9	6.5	15.8
Math and computer	33.7	18.3	18.3	22.4	7.3
Environmental	79.6	7.0	3.1	6.7	3.6
Life	20.6	9.3	38.5	29.4	2.3
Psychology and social	92.8	5.2	0.0	2.0	0.0
Total, science	55.8	12.0	12.8	12.6	6.6
Other	24.7	15.9	23.3	11.1	24.9
Total	57.5	11.4	11.2	8.8	11.1

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy *1978 National Survey of Recent Science and Engineering Graduates.*

Table A-22. Occupation Versus Time Spent on Energy-Related Activities: Energy-Related 1976 Graduates in 1978

Occupation	Percent of Time Spent on Energy-Related Activities				
	100	75-99	50-74	25-49	24 or Less
	(Percent of Graduates)				
Engineering					
Chemical	38.2	9.9	20.2	13.6	18.1
Civil	77.8	12.9	3.3	3.6	2.5
Electrical or electronic	37.3	20.6	18.2	11.2	12.7
Mechanical	52.8	16.0	12.6	12.2	6.3
Nuclear, petroleum, or mining	75.0	8.8	8.9	3.9	3.4
Other	53.7	10.9	6.6	13.2	15.6
Total, engineering	57.2	13.0	11.0	9.7	9.2
Science					
Physical	50.3	20.8	16.2	3.3	9.4
Math and computer	68.4	5.4	16.5	7.1	2.6
Environmental	73.5	13.0	2.2	5.0	6.2
Life	35.4	5.6	44.4	14.7	0.0
Psychology and social	54.9	7.3	31.6	2.7	3.5
Total, science	59.1	11.8	18.3	5.5	5.2
Other	46.5	21.9	13.5	1.9	16.2
Total	56.5	13.6	13.4	7.6	8.9

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table A-23. Highest Degree Held Versus Time Spent on Energy-Related Activities: Energy-Related 1972 Graduates in 1978

Highest Degree	Percent of Time Spent on Energy-Related Activities				
	100	75-99	50-74	25-49	24 or Less
	(Percent of Graduates)				
Bachelor's	56.8	9.7	10.2	10.5	12.8
Master's	60.3	13.4	10.8	6.5	9.0
Ph.D.[a]	55.7	11.1	18.1	7.4	7.7

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

[a] The reader should note that the Ph.D.'s included here are only those selected as bachelor's- or master's-degree recipients who have earned doctorates since graduation. The group is very small and does not represent all Ph.D.'s.

Table A-24. Highest Degree Held Versus Time Spent on Energy-Related Activities: Energy-Related 1976 Graduates in 1978

Highest Degree	Percent of Time Spent on Energy-Related Activities				
	100	75-99	50-74	25-49	24 or Less
	(Percent of Graduates)				
Bachelor's	55.3	13.3	14.3	8.3	8.9
Master's	58.3	14.3	11.8	6.4	9.2
Ph.D.[a]	78.0	14.9	7.1	0.0	0.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

[a] The reader should note that the Ph.D.'s included here are only those selected as bachelor's- or master's-degree recipients who have earned doctorates since graduation. The group is very small and does not represent all Ph.D.'s.

Table A-25. Principal Employer Versus Time Spent on Energy-Related Activities: Energy-Related 1972 Graduates in 1978

	Percent of Time Spent on Energy-Related Activities				
Employer	100	75-99	50-74	25-49	24 or Less
		(Percent of Graduates)			
Private industry	60.5	11.9	9.4	7.8	10.3
Education	31.5	9.4	21.0	27.9	10.2
Federal government	46.7	4.8	18.5	0.8	29.3
State and local government	55.8	23.5	17.8	3.0	0.0
Non-profit organization	75.6	4.9	19.5	0.0	0.0
Other	62.2	10.9	11.7	15.2	0.0
Total	58.2	11.3	11.2	8.4	11.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table A-26. Principal Employer Versus Time Spent on Energy-Related Activities: Energy-Related 1976 Graduates in 1978

	Percent of Time Spent on Energy-Related Activities				
Employer	100	75-99	50-74	25-49	24 or Less
		(Percent of Graduates)			
Private industry	60.9	11.9	10.1	7.1	10.1
Education	38.8	16.2	29.4	10.3	5.2
Federal government	48.8	17.8	12.7	15.5	5.2
State and local government	50.8	8.6	40.6	0.0	0.0
Non-profit organization	32.5	37.5	20.8	5.8	3.4
Other	34.1	51.5	10.8	0.0	3.7
Total	56.5	13.6	13.4	7.6	8.9

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table A-27. Detailed Comparison of Major Field of Study for Highest Degree Held and Occupation: Energy-Related 1972 Graduates in 1978[a]

	Occupation					
	Engineering					
Major	Chemical	Civil	Electrical or Electronic	Mechanical	Nuclear, Petroleum, or Mining	Other Engineering
Engineering						
Chemical	825 (56.8)	0	0	0	141	375
Civil	0	731 (52.7)	31	81	177	157
Electrical or electronic	0	10	1,550 (61.1)	52	191	542
Mechanical	0	0	27	2,111 (63.0)	228	511
Nuclear, petroleum, or mining	19	0	0	103	1,308 (81.5)	90
Other	0	0	186	123	344	1,255 (59.7)
Total, engineering	844	741	1,794	2,470	2,389	2,930
Science						
Physical	76	0	50	23	50	123
Math and computer	0	0	0	36	244	121
Environmental	0	0	0	0	66	27
Life	0	0	7	0	432	147
Psychology and social	0	0	0	0	260	105
Total, science	76	0	57	59	1,052	523
Other	57	10	70	713	16	0
Total	977	752	1,921	3,242	3,459	3,456

Table A-27. Detailed Comparison of Major Field of Study for Highest Degree Held and Occupation: Energy-Related 1972 Graduates in 1978[a] (Continued)

	Occupation						
	Science						
Major	Physical	Math and Computer	Environmental	Life	Psychology and Social	Other	Total
Engineering							
Chemical	0	19	0	0	0	92	1,453
Civil	0	17	0	0	0	194	1,389
Electrical or electronic	0	103	0	0	0	87	2,536
Mechanical	0	0	16	36	0	424	3,354
Nuclear, petroleum, or mining	0	0	43	0	0	41	1,605
Other	34	62	0	0	27	71	2,102
Total, engineering	34	201	59	36	27	909	12,439
Science							
Physical	1,066 (61.2)	41	41	0	18	255	1,743
Math and computer	0	614 (44.7)	114	0	0	244	1,374
Environmental	0	0	1,451 (85.7)	0	24	126	1,695
Life	196	0	0	420 (27.9)	0	305	1,508
Psychology and social	0	440	0	0	447 (19.8)	1,007	2,259
Total, science	1,262	1,095	1,606	420	489	1,937	8,579
Other	0	0	0	81	111	1,033 (49.4)	2,090
Total	1,296	1,296	1,666	537	627	3,878	23,106

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

NOTES: Figures in parentheses are the percent of graduates in each degree field who hold jobs in the same field. Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-28. Detailed Comparison of Major Field of Study for Highest Degree Held and Occupation: Energy-Related 1976 Graduates in 1978[a]

	Occupation					
	Engineering					
Major	Chemical	Civil	Electrical or Electronic	Mechanical	Nuclear, Petroleum, or Mining	Other Engineering
Engineering						
Chemical	1,361 (73.9)	0	0	0	205	92
Civil	0	1,323 (68.7)	0	189	185	206
Electrical or electronic	14	0	1,561 (76.7)	29	72	159
Mechanical	12	26	37	2,195 (67.9)	315	469
Nuclear, petroleum, or mining	0	26	42	167	1,242 (77.2)	111
Other	0	110	97	678	172	1,317 (45.4)
Total, engineering	1,387	1,485	1,737	3,258	2,191	2,354
Science						
Physical	53	0	21	39	109	0
Math and computer	0	0	71	76	76	149
Environmental	0	0	33	32	181	121
Life	133	0	0	250	510	13
Psychology and social	0	0	0	139	185	312
Total, science	186	0	125	536	1,061	595
Other	0	0	29	26	9	41
Total	1,573	1,484	1,892	3,820	3,261	2,992

Table A-28. Detailed Comparison of Major Field of Study for Highest Degree Held and Occupation: Energy-Related 1976 Graduates in 1978[a] (Continued)

	Occupation						
	Science						
Major	Physical	Math and Computer	Environmental	Life	Psychology and Social	Other	Total
Engineering							
Chemical	0	41	0	11	0	131	1,842
Civil	0	0	0	22	0	0	1,924
Electrical or electronic	14	14	0	0	29	145	2,036
Mechanical	0	0	0	0	0	178	3,233
Nuclear, petroleum, or mining	0	0	20	0	0	0	1,609
Other	44	101	0	0	0	381	2,899
Total, engineering	58	156	20	33	29	835	13,561
Science							
Physical	1,151 (72.3)	41	47	0	0	130	1,590
Math and computer	0	1,188 (64.0)	40	0	40	216	1,855
Environmental	119	13	1,710 (75.4)	19	39	0	2,267
Life	251	0	112	588 (23.6)	0	636	2,494
Psychology and social	131	32	0	0	963	2,237 (24.1)	4,000
Total, science	1,652	1,274	1,909	607	1,042	3,219	12,206
Other	98	0	39	0	131	0 (0.0)	374
Total	1,807	1,431	1,968	639	1,203	4,054	26,123

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTES: Figures in parentheses are the percent of graduates in each degree field who hold jobs in the same field. Figures may not add to totals due to independent rounding.

[a] Due to the small number of respondents in each detailed category, and the large weights assigned to some respondents, the detailed figures in this table are less reliable than the aggregated figures used elsewhere in this report.

Table A-29. Type of Employer by Occupation: Total Versus Energy-Related Recent Graduates and Bachelor's Versus Master's, 1972 Graduates in 1978

Type of Employer	All Scientists and Engineers B.S. (Percent)	All Scientists and Engineers M.S. (Percent)	Engineers B.S. (Percent)	Engineers M.S. (Percent)	Scientists B.S. (Percent)	Scientists M.S. (Percent)
Total						
Private industry	65.5	49.7	80.6	71.7	49.3	34.7
Educational institution	9.4	18.7	1.6	2.4	17.7	29.8
Federal government	9.3	11.9	6.7	14.4	12.1	10.2
State and local government	9.7	9.5	7.4	5.3	12.3	12.4
Non-profit organization	1.7	3.5	1.2	2.0	2.3	4.6
Other	4.3	6.7	2.5	4.2	6.3	8.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Energy-Related						
Private industry	87.7	82.4	88.8	89.3	84.1	67.4
Educational institution	1.3	6.4	0.1	2.2	5.5	15.7
Federal government	3.9	7.1	4.2	4.7	2.7	12.4
State and local government	1.9	2.6	0.6	3.4	6.5	1.0
Non-profit organization	3.7	1.3	4.4	0.4	1.2	3.5
Other	1.5	0.0	1.9	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table A-30. Type of Employer by Occupation: Total Versus Energy-Related Recent Graduates and Bachelor's Versus Master's, 1976 Graduates in 1978

	Total					
	All Scientists and Engineers		Engineers		Scientists	
Type of Employer	B.S.	M.S.	B.S.	M.S.	B.S.	M.S.
	(Percent)		(Percent)		(Percent)	
Private industry	58.3	42.7	83.1	69.0	41.4	27.2
Educational institution	14.4	26.3	3.3	9.9	21.9	35.9
Federal government	7.5	9.1	6.2	11.3	8.4	7.9
State and local government	9.8	7.9	4.4	4.5	13.5	9.9
Non-profit organization	3.4	4.8	0.2	1.8	5.6	6.7
Other	6.6	9.2	2.8	3.6	9.1	12.5
Total	100.0	100.0	100.0	100.0	100.0	100.0
	Energy-Related					
Private industry	81.1	70.0	90.0	75.3	59.7	60.9
Educational institution	11.2	15.8	5.9	11.6	24.0	22.9
Federal government	4.1	8.8	3.2	9.1	6.3	8.2
State and local government	1.4	2.5	0.1	0.7	4.5	5.6
Non-profit organization	1.5	2.9	0.1	3.4	5.0	2.0
Other	0.6	0.2	0.7	0.0	0.5	0.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table A-31. Primary Work Activity Involved in the Occupation of Energy-Related 1972 Graduates: Bachelor's Versus Master's in 1978

Activity	All Scientists and Engineers		Engineers		Scientists	
	Bachelor's (Percent)	Master's (Percent)	Bachelor's (Percent)	Master's (Percent)	Bachelor's (Percent)	Master's (Percent)
Management	16.2	21.1	19.7	25.5	3.8	11.3
Teaching	1.9	2.2	1.7	1.6	2.8	3.5
Basic research	0.5	5.1	0.3	0.8	1.3	14.9
Applied research	5.0	10.3	4.3	6.2	7.7	19.4
Development	7.9	7.8	8.8	9.4	4.6	4.2
Report, technical writing	5.9	6.1	6.0	5.2	5.6	8.3
Design	16.0	10.7	19.7	15.5	2.8	0.0
Quality control	9.0	1.6	8.0	1.4	12.7	2.0
Operations	17.4	6.2	21.2	8.1	3.8	2.0
Distribution	2.2	1.5	2.9	2.1	0.0	0.0
Consulting	6.2	6.7	4.3	7.9	13.1	4.2
Other	11.6	20.8	3.2	16.5	41.7	30.3
No answer	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table A-32. Primary Work Activity Involved in the Occupation of Energy-Related 1976 Graduates: Bachelor's Versus Master's in 1978

Activity	All Scientists and Engineers		Engineers		Scientists	
	Bachelor's (Percent)	Master's (Percent)	Bachelor's (Percent)	Master's (Percent)	Bachelor's (Percent)	Master's (Percent)
Management	10.8	13.5	12.9	17.9	5.8	6.1
Teaching	0.3	3.9	0.0	2.1	1.0	6.9
Basic research	6.3	8.9	1.2	5.2	18.8	15.0
Applied research	8.3	14.3	3.4	9.2	20.4	22.9
Development	7.9	8.4	8.9	9.6	5.5	6.3
Report, technical writing	5.0	9.0	5.3	10.3	4.3	6.7
Design	14.8	11.7	19.7	18.2	2.5	0.9
Quality control	9.5	1.8	10.0	2.4	8.1	0.7
Operations	19.7	4.5	27.1	6.2	1.4	1.7
Distribution	3.1	0.3	3.2	0.0	2.7	0.8
Consulting	2.1	6.6	2.8	9.4	0.5	2.0
Other	12.0	17.0	5.3	9.2	28.7	30.0
No answer	0.2	0.1	0.1	0.1	0.5	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table A-33. Primary Work Activity Involved in the Occupation of 1972 Graduates: Total Bachelor's Versus Master's in 1978

Activity	All Scientists and Engineers		Engineers		Scientists	
	Bachelor's (Percent)	Master's (Percent)	Bachelor's (Percent)	Master's (Percent)	Bachelor's (Percent)	Master's (Percent)
Management	17.3	19.2	19.7	26.2	14.7	14.4
Teaching	4.2	9.3	0.9	1.4	7.8	14.6
Basic research	4.2	4.9	0.6	0.9	8.1	7.6
Applied research	3.7	7.5	1.7	4.7	5.9	9.4
Development	9.3	10.0	13.0	16.7	5.2	5.4
Report, technical writing	4.2	8.0	5.7	6.5	2.5	9.0
Design	9.5	6.1	16.7	13.9	1.6	0.8
Quality control	6.6	3.6	7.5	4.6	5.5	2.9
Operations	14.6	4.5	22.0	7.8	6.5	2.3
Distribution	2.7	1.5	2.1	1.2	3.5	1.7
Consulting	3.6	4.9	3.6	5.9	3.6	4.3
Other	19.8	19.3	5.9	9.2	35.0	26.4
No answer	0.3	1.3	0.4	1.0	0.2	1.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table A-34. Primary Work Activity by Occupation of 1976 Graduates: Total Bachelor's Versus Master's in 1978

Activity	All Scientists and Engineers		Engineers		Scientists	
	Bachelor's (Percent)	Master's (Percent)	Bachelor's (Percent)	Master's (Percent)	Bachelor's (Percent)	Master's (Percent)
Management	10.7	12.1	10.3	16.7	10.8	9.4
Teaching	4.9	9.6	0.6	1.6	7.8	14.3
Basic research	8.4	10.4	0.8	3.9	13.6	14.3
Applied research	6.6	8.8	3.2	7.8	8.9	9.4
Development	7.7	8.5	12.9	15.2	4.2	4.6
Report, technical writing	7.4	9.3	7.3	10.1	7.5	8.9
Design	8.1	8.1	17.8	18.4	1.4	2.0
Quality control	9.4	3.3	12.3	4.8	7.5	2.4
Operations	12.9	4.4	22.2	6.8	6.6	3.0
Distribution	2.8	0.7	1.5	0.3	3.7	1.0
Consulting	2.2	3.3	3.1	4.8	1.6	2.3
Other	17.9	20.1	7.1	9.0	25.3	26.6
No answer	0.8	1.3	0.4	0.5	1.1	1.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to 100.0 percent due to independent rounding.

Table A-35. Major Field of Study for Highest Degree Held Versus Employment Status: Total 1972 Graduates in 1978[a]

Major	Employment Status: Full-Time, Science or Engineering	Percent	Full-Time, Non-Science, Non-Engineering	Percent	Part-Time	Percent	Post-Doctoral	Percent
Engineering								
Chemical	3,808	83.9	652	14.3	81	1.8	0	0.0
Civil	7,961	87.8	1,047	11.6	54	0.6	0	0.0
Electrical or electronic	14,891	85.2	2,171	12.4	328	1.9	93	0.5
Mechanical	8,561	80.4	1,986	18.7	95	0.9	0	0.0
Nuclear, petroleum, or mining	2,067	84.2	387	15.8	0	0.0	0	0.0
Other	14,690	72.2	5,344	26.3	183	0.9	108	0.5
Total, engineering	51,978	80.5	11,587	18.0	741	1.1	201	0.3
Science								
Physical	9,152	57.1	5,324	33.2	955	6.0	609	3.8
Math and computer	15,631	57.5	10,287	37.8	1,137	4.2	151	0.6
Environmental	4,668	50.8	3,716	40.4	733	8.0	76	0.8
Life	17,709	38.5	22,615	49.1	3,919	8.5	1,806	3.9
Psychology and social	24,341	19.6	86,163	69.3	12,409	10.0	1,340	1.1
Total, science	71,501	32.1	128,105	57.5	19,153	8.6	3,982	1.8
Other	5,296	4.1	38,627	78.5	423	0.9	2,764	5.6
Total	128,775	38.3	178,319	53.0	22,454	6.7	6,946	2.1

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] As in Tables 27 and 28, this table includes only employed graduates.

Table A-36. Major Field of Study for Highest Degree Held Versus Employment Status: Total 1976 Graduates in 1978[a]

Major	Employment Status							
	Full-Time, Science or Engineering	Percent	Full-Time, Non-Science, Non-Engineering	Percent	Part-Time	Percent	Post-Doctoral	Percent
Engineering								
Chemical	3,631	83.8	320	7.4	322	7.4	59	1.4
Civil	9,283	88.8	822	7.9	318	3.0	34	0.3
Electrical or electronic	12,981	89.7	889	6.1	529	3.7	70	0.5
Mechanical	8,053	86.6	834	9.0	378	4.1	35	0.4
Nuclear, petroleum, or mining	2,182	86.2	158	6.2	149	5.9	42	1.6
Other	14,887	73.6	4,546	22.5	668	3.3	115	0.6
Total, engineering	51,017	83.2	7,569	12.3	2,364	3.9	355	0.6
Science								
Physical	7,502	54.1	2,065	14.9	3,961	28.6	342	2.5
Math and computer	16,228	65.9	5,871	23.8	2,483	10.1	48	0.2
Environmental	5,760	62.3	2,536	27.4	882	9.5	62	0.7
Life	25,491	38.1	27,904	41.8	12,891	19.3	539	0.8
Psychology and social	25,963	20.1	84,047	65.1	18,704	14.5	375	0.3
Total, science	80,944	33.2	122,423	50.2	38,921	16.0	1,366	0.6
Other	2,055	18.7	7,440	67.9	951	8.7	518	4.7
Total	134,014	42.4	137,430	43.5	42,235	13.3	2,240	0.7

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates*.

NOTE: Figures may not add to totals due to independent rounding.

[a] As in Tables 27 and 28, this table includes only employed graduates.

Table A-37. Major Field of Study for Highest Degree Held Versus Employment Status: Energy-Related 1972 Graduates in 1978[a]

Major	Employment Status: Full-Time, Science or Engineering	Percent	Full-Time, Non-Science, Non-Engineering	Percent	Part-Time	Percent	Post-Doctoral	Percent
Engineering								
Chemical	1,347	92.7	92	6.4	14	0.9	0	0.0
Civil	1,195	86.0	194	14.0	0	0.0	0	0.0
Electrical or electronic	2,426	95.7	87	3.4	0	0.0	23	0.9
Mechanical	2,878	85.8	424	12.6	52	1.6	0	0.0
Nuclear, petroleum, or mining	1,564	97.4	41	2.6	0	0.0	0	0.0
Other	1,942	91.2	98	4.6	62	2.9	27	1.3
Total, engineering	11,353	91.1	936	7.5	128	1.0	50	0.4
Science								
Physical	1,288	73.9	255	14.6	128	7.3	73	4.2
Math and computer	1,130	82.3	244	17.7	0	0.0	0	0.0
Environmental	1,448	85.4	126	7.4	94	5.5	27	1.6
Life	1,066	60.7	544	31.6	136	7.8	0	0.0
Psychology and social	1,252	55.4	1,007	44.6	0	0.0	0	0.0
Total, science	6,184	70.0	2,186	24.8	358	4.1	100	1.1
Other	1,057	50.6	1,033	49.4	0	0.0	0	0.0
Total	18,592	79.5	4,155	17.8	485	2.1	150	0.6

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] As in Tables 27 and 28, this table includes only employed graduates.

Table A-38. Major Field of Study for Highest Degree Held Versus Employment Status: Energy-Related 1976 Graduates in 1978[a]

	Employment Status							
Major	Full-Time, Science or Engineering	Percent	Full-Time, Non-Science, Non-Engineering	Percent	Part-Time	Percent	Post-Doctoral	Percent
Engineering								
Chemical	1,552	84.3	131	7.1	123	6.7	36	2.0
Civil	1,879	97.6	0	0.0	34	1.8	11	0.6
Electrical or electronic	1,849	90.8	145	7.1	0	0.0	43	2.1
Mechanical	2,962	91.6	178	5.5	92	2.9	0	0.0
Nuclear, petroleum, or mining	1,500	93.3	0	0.0	108	6.7	0	0.0
Other	2,367	81.7	381	13.1	72	2.5	79	2.7
Total, engineering	12,109	89.4	835	6.2	429	3.2	169	1.2
Science								
Physical	974	61.3	130	8.2	486	30.6	0	0.0
Math and computer	1,562	84.2	216	11.6	78	4.2	0	0.0
Environmental	2,156	95.1	0	0.0	110	4.9	0	0.0
Life	1,324	53.1	553	22.2	617	24.7	0	0.0
Psychology and social	1,277	31.9	1,843	46.1	880	22.0	0	0.0
Total, science	7,293	59.7	2,742	22.5	2,171	17.8	0	0.0
Other	359	96.2	0	0.0	14	3.8	0	0.0
Total	19,763	75.7	3,576	13.7	2,616	10.0	168	0.6

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

NOTE: Figures may not add to totals due to independent rounding.

[a] As in Tables 27 and 28, this table includes only employed graduates.

Table A-39. Median Annual Salary: Total Versus Energy-Related 1972 Graduates in 1978, Bachelors

Field	Occupation			Major		
	Energy-Related (Dollars)	Total (Dollars)	Ratio of Energy-Related to Total	Energy-Related (Dollars)	Total (Dollars)	Ratio of Energy-Related to Total
Engineering						
Chemical	22,000	21,000	1.05	22,900	21,000	1.09
Civil	22,100	19,800	1.12	22,200	19,400	1.14
Electrical or electronic	22,000	21,000	1.05	21,600	21,000	1.03
Mechanical	22,000	21,800	1.01	22,500	20,000	1.13
Nuclear, petroleum, or mining	24,000	21,900	1.10	26,600	22,000	1.21
Other	20,000	19,000	1.05	20,000	19,800	1.01
Total, engineering	21,800	20,000	1.09	21,900	20,000	1.10
Science						
Physical	22,000	16,000	1.38	21,000	16,000	1.31
Math and computer	19,000	17,600	1.08	20,000	18,800	1.06
Environmental	20,000	15,000	1.33	20,000	18,000	1.11
Life[a]	22,500	15,000	1.50	15,600	14,700	1.06
Psychology and social[a]	20,800	15,000	1.39	20,000	14,400	1.39
Total, science	20,000	16,100	1.24	19,500	15,000	1.30
Other	19,000	15,000	1.27	—	—	—
Total	20,800	16,000	1.30	20,800	16,000	1.30

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

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[a] There are few energy-related social and life scientists by occupation, and their earnings distribution is bimodal; among life scientists, 48 percent indicated earnings of $8,000 or less per year, while 52 percent indicated earnings of $22,500 per year. Fifty-two percent of social scientists indicated earnings of $20,800 and 48 percent, earnings of $22,400 per year.

Table A-40. Median Annual Salary: Total Versus Energy-Related 1976 Graduates in 1978, Bachelor's

Field	Occupation: Energy-Related (Dollars)	Occupation: Total (Dollars)	Occupation: Ratio of Energy-Related to Total	Major: Energy-Related (Dollars)	Major: Total (Dollars)	Major: Ratio of Energy-Related to Total
Engineering						
Chemical	20,000	18,600	1.08	20,500	19,500	1.05
Civil	17,500	16,200	1.08	18,000	16,200	1.11
Electrical or electronic	18,000	17,500	1.03	18,000	17,600	1.02
Mechanical	18,000	17,200	1.05	19,500	18,000	1.08
Nuclear, petroleum, or mining	18,000	17,000	1.06	20,000	18,200	1.10
Other	18,000	16,000	1.13	18,000	16,000	1.13
Total, engineering	18,000	17,000	1.06	18,300	17,000	1.08
Science						
Physical	14,000	12,000	1.17	15,000	11,700	1.28
Math and computer	16,600	15,100	1.10	16,400	15,000	1.09
Environmental	15,000	12,000	1.25	15,000	12,000	1.25
Life	10,500	10,000	1.05	12,000	10,800	1.11
Psychology and social	15,600	10,000	1.56	11,000	10,900	1.01
Total, science	14,300	11,000	1.30	13,700	11,000	1.25
Other	11,800	11,000	1.07	—	—	—
Total	17,000	12,000	1.42	17,000	12,000	1.42

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table A-41. Median Annual Salary: Total Versus Energy-Related 1972 Graduates in 1978, Masters

Field	Occupation			Major		
	Energy-Related (Dollars)	Total (Dollars)	Ratio of Energy-Related to Total	Energy-Related (Dollars)	Total (Dollars)	Ratio of Energy-Related to Total
Engineering						
Chemical	22,000	23,100	0.95	22,000	23,100	0.95
Civil	24,000	23,000	1.04	23,800	23,000	1.03
Electrical or electronic	23,400	24,000	0.98	23,400	24,000	0.98
Mechanical	26,000	24,000	1.08	24,000	23,700	1.01
Nuclear, petroleum, or mining	24,000	24,000	1.00	22,800	23,400	0.97
Other	20,800	22,500	0.92	27,000	24,000	1.13
Total, engineering	24,000	23,400	1.03	23,700	24,000	0.99
Science						
Physical	23,000	18,000	1.28	19,000	17,900	1.06
Math and computer	21,500	20,000	1.08	21,300	20,000	1.07
Environmental	24,000	18,500	1.30	24,000	18,400	1.30
Life	13,400	15,300	0.88	17,000	15,300	1.11
Psychology and social	22,000	16,000	1.38	20,000	16,100	1.24
Total, science	21,500	17,100	1.26	21,300	17,000	1.25
Other	22,000	15,500	1.42	24,000	14,600	1.64
Total	23,000	18,000	1.28	23,000	18,000	1.28

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

Table A-42. Median Annual Salary: Total Versus Energy-Related 1976 Graduates in 1978, Masters

Field	Occupation: Energy-Related (Dollars)	Occupation: Total (Dollars)	Occupation: Ratio of Energy-Related to Total	Major: Energy-Related (Dollars)	Major: Total (Dollars)	Major: Ratio of Energy-Related to Total
Engineering						
Chemical	20,000	20,000	1.00	21,000	20,700	1.01
Civil	19,600	18,500	1.06	20,000	18,500	1.08
Electrical or electronic	20,400	20,000	1.02	20,600	19,700	1.05
Mechanical	20,500	19,800	1.04	20,000	20,000	1.00
Nuclear, petroleum, or mining	21,200	20,700	1.02	20,000	20,000	1.00
Other	20,000	19,000	1.05	21,900	19,800	1.11
Total, engineering	20,000	19,500	1.03	20,400	19,600	1.04
Science						
Physical	10,000	10,900	0.92	9,600	13,000	0.74
Math and computer	18,300	17,000	1.08	17,900	17,600	1.02
Environmental	20,000	18,000	1.11	20,000	17,600	1.14
Life	10,000	12,000	0.83	12,000	12,000	1.00
Psychology and social	15,400	13,000	1.18	15,000	13,000	1.15
Total, science	17,000	13,100	1.30	16,200	13,500	1.20
Other	15,000	15,000	1.00	18,900	15,500	1.22
Total	19,000	15,500	1.23	19,000	15,500	1.23

Source: Westat, Inc./National Science Foundation and U.S. Department of Energy, *1978 National Survey of Recent Science and Engineering Graduates.*

APPENDIX B - QUESTIONNAIRE USED IN 1978 NATIONAL SURVEY OF RECENT SCIENCE AND ENGINEERING GRADUATES

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

Dear Graduate:

We need your help in a major national study of the occupational experiences of recent graduates in Science and Engineering. This project, sponsored by the National Science Foundation and the U.S. Department of Energy, will obtain information from a scientifically chosen sample of 13,000 persons who earned Bachelor's or Master's degrees between July 1, 1975 and June 30, 1976. The sample consists of graduates in engineering and natural, physical, or social science. You are one of those chosen to be in this study.

The purpose of this study is to compile national statistics which will allow an appraisal of the employment and educational characteristics of scientists and engineers graduating in 1975/76.

The resulting information will permit the Federal Government, universities and others to formulate science policies and programs and to make evaluations with regard to the science and engineering manpower potential of the nation.

The questionnaire on the following pages will take about 10-15 minutes of your time to complete, and a postage-paid envelope addressed to Westat, Inc. is enclosed for its return. Westat, Inc. has been selected by the National Science Foundation to assist in carrying out this survey.

We wish you to know that your completed questionnaire will be seen only by the immediate research staff and will be used for statistical purposes only. In compliance with the Privacy Act of 1974, no personally identifying information will be released to anyone.

We think you will find it interesting and invite your comments on the questionnaire items. In addition, if you have any questions on the survey or need any assistance in completing the questionnaire, please call (collect) Mr. Mark Waksberg or Mr. George K. Schueller at (301) 881-5310.

It would be of great help if you would complete and return the questionnaire within the next five days. If possible, we suggest that you do it now, while you have it in hand. We believe the importance of the study will justify the time you give to it.

The National Science Foundation and the U.S. Department of Energy would greatly appreciate your cooperation in this survey.

Very truly yours,

Charles E Falk

Charles E. Falk, Director
Division of Science Resources Studies

This information is solicited under the authority of the National Science Foundation Act of 1950, as amended. All information you provide will be treated as confidential and will be used for statistical purposes only. Information will be released only in the form of statistical summaries from which it will be impossible to identify information about any particular person. Your response is entirely voluntary and your failure to provide some or all of the requested information will in no way adversely affect you.

1978 SURVEY OF RECENT SCIENCE AND ENGINEERING GRADUATES

NATIONAL SCIENCE FOUNDATION AND THE U.S. DEPARTMENT OF ENERGY

DEGREE AND EMPLOYMENT SPECIALTY LIST

Use this list for questions 8 and 15. Find the number corresponding to the appropriate major field and mark it in the space provided in the questionnaire.

AGRICULTURAL SCIENCE

001	Agronomy
002	Animal/Dairy/Poultry Science
003	Horticulture
004	Range Management
005	Forestry
006	Other Agricultural Sciences

BIOLOGICAL SCIENCE

007	Anatomy and Histology
008	Bacteriology
009	Biochemistry
010	Biology, General
011	Biophysics
012	Botany, Plant Pathology
013	Entomology
014	Genetics
015	Immunology
016	Marine Science
017	Microbiology
018	Physiology
019	Zoology
020	Nutrition (excluding Home Economics)
021	Pharmacology
022	Other Biological Science

ENGINEERING

023	Aeronautical, Aerospace, Astronautical
024	Agricultural
025	Architectural
026	Ceramic
027	Chemical
028	Civil
029	Electrical or Electronic
030	Environmental, Sanitary
031	General
032	Geological
033	Industrial
034	Mechanical
035	Metallurgical, Materials
036	Mining
037	Nuclear
038	Operations Research, Systems
039	Petroleum
040	Technology (Bachelor's level)
041	Other Engineering

PHYSICAL SCIENCE, MATHEMATICAL SCIENCE

042	Astronomy
043	Atmospheric Science (Meterology)
044	Chemistry
045	Computer Science and Data Processing
046	Earth Science (Geology, Geophysics)
047	Geography
048	Mathematics
049	Oceanography
050	Physics
051	Statistics
052	Other Physical Sciences

SOCIAL SCIENCE

053	Anthropology
054	Economics, all fields
055	Linguistics
056	Political Science (including Government, International Relations)
057	Public Administration
058	Psychology (all fields except Clinical)
059	Social Work, all fields
060	Sociology
061	Criminology
062	Urban Studies
063	Other Social Science

ARTS AND HUMANITIES

064	Art, Fine and Applied
065	English (Language and Literature)
066	Foreign Language and Literature
067	History
068	Journalism, all fields
069	Music, all fields
070	Philosophy, all fields
071	Other Arts and Humanities

BUSINESS

072	Accounting
073	Business Administration, General
074	Finance
075	Marketing and Sales
076	Management, all fields
077	Secretarial Studies
078	Other Business

EDUCATION

079	Art or Music Education
080	Biological Science Education
081	Business Education
082	Elementary Education
083	Engineering Education
084	Mathematics Education
085	Physical Education or Recreation
086	Physical Sciences Education
087	Secondary Education
088	Science Education, Other
089	Special Education
090	Other Education

OTHER PROFESSIONS, TECHNICAL FIELDS

091	Architecture or Urban Planning
092	Clinical Psychology
093	Drafting or Design, all fields
094	Home Economics
095	Health Technology (Medical, Dental, Lab)
096	Dentistry
097	Medicine or Pre-Medicine
098	Nursing
099	Pharmacy
100	Other Health Professions
101	Law or Pre-Law
102	Library or Archival Science
103	Religion
104	Other

OTHER

105	Building Trades
106	Communications (Radio, TV)
107	Crafts (Skilled), all fields
108	Law Enforcement
109	Machine Operation
110	Military Science
111	Other, not elsewhere classified

OMB NO. 99S - 78016
Expires March 1979

1978 SURVEY OF RECENT SCIENCE AND ENGINEERING GRADUATES

NATIONAL SCIENCE FOUNDATION AND THE U.S. DEPARTMENT OF ENERGY

1. Date of Birth

☐☐☐
Mo. Day Year

2. Citizenship

USA .... 1 ☐
Non-USA .... 2 ☐
(Specify country): ____________

3. Sex

Male 1☐
Female 2☐

4. What is your racial background?

American Indian or Alaska native .... 1 ☐
Asian or Pacific Islander. 2 ☐
Black .... 3 ☐
White .... 4 ☐

4a. Is your ethnic heritage Hispanic?

Hispanic origin ... 1 ☐
Not of Hispanic origin ... 2 ☐

5. What is your marital status?

Single, never married .... 1 ☐ *Go to 6*
Separated, divorced, or widowed .... 2 ☐
Married .... 3 ☐

5a. Do you have any children?

No .. 1 ☐ Yes, under age 6 .... 2 ☐ Yes, 6 years of age or over .... 3 ☐

6. Are you physically handicapped?

Yes ..... 1 ☐ No ..... 2 ☐ *Go to 7*

6a. What is the nature of your handicap(s)? *(Mark as many as apply.)*

Visual .... 1 ☐
Auditory .... 2 ☐
Orthopedic .... 3 ☐
Other *(Specify)*: ____________________ 4 ☐

7. Which of the following best describes your enrollment status as of the week of August 7, 1978? *(Mark one only.)*

Not a student .... 1 ☐
Graduate student (post baccalaureate)
Full-time .... 2 ☐
Part-time .... 3 ☐
Undergraduate student .... 4 ☐

8. List in the table below all undergraduate and graduate degrees, excluding honorary degrees, that have been awarded to you. Please use Specialty List on page 2 for major field and number.

Type of Degree	Granted		Major Field (Use Specialty List)	
	Month	Year	Name	Number
Bachelor's				
Master's				
Doctorate				
Other *(Specify)*				

9. How many years of professional work experience, including teaching, have you had? (Professional experience includes those work activities in which you have been engaged requiring knowledge of your field at the baccalaureate or equivalent background.)

Years ...... ☐

PLEASE NOTE that in items 10-22 information is requested for the current year as of the week of August 7, 1978.

10. What was your employment status as of the period indicated? *(Check only ONE category.)*

Employed full-time, science or engineering-related position .... 1 ☐ *Go to 11*
Employed full-time, nonscience or nonengineering-related position ..... 2 ☐ *Go to 10a*
Employed part-time, science or engineering-related position .... 3 ☐ *Go to 10b*
Employed part-time, nonscience or nonengineering-related position ..... 4 ☐ *Go to 10b*
Postdoctoral appointment (fellowship, traineeship, research associateship, etc.) .... 5 ☐ *Go to 11*
Unemployed and seeking employment ..... 6 ☐ *Go to 10c and 10d*
Not employed and not seeking employment .... 7 ☐ *Go to 10e*
Retired and not employed .... 8 ☐ *Go to 23*
Other *(Specify)*: ____________________ 9 ☐ *Go to 11*

10a. If you were employed full-time during the week of August 7, 1978, in a position unrelated to science or engineering, what was the MOST important reason for taking the position?

Prefer nonscience or nonengineering position .... 1 ☐
Promoted out of science or engineering position .... 2 ☐
Pay is better .... 3 ☐
Locational preference .... 4 ☐
Science or engineering position not available .... 5 ☐
Other *(Specify)*: ____________________ 6 ☐
} *Go to 11*

10b. If you were employed part-time during the week of August 7, 1978, were you seeking full-time employment?

Yes ..... 1 ☐ No ..... 2 ☐ *Go to 11*

10c. If you were unemployed and seeking employment during the week of August 7, 1978, was your job search restricted by:

Geographic location .... 1 ☐
Family responsibilities .... 2 ☐
Need for part-time employment .... 3 ☐
Other *(Specify)*: ____________________ 4 ☐

10d. How many weeks, during the period of unemployment ending with the week of August 7, 1978, were you unemployed and seeking work?

Weeks ...... ☐ *Go to 23*

10e. If you were not employed and not seeking work during the week of August 7, 1978, what was the most important reason for not seeking work?

- Full-time graduate student .... 1 ☐
- Temporarily absent for health or personal reasons .... 2 ☐
- Tending to family responsibilities .. 3 ☐
- Could not find work or believed no job available in my field .... 4 ☐
- Insufficient financial incentive .... 5 ☐
- On layoff .... 6 ☐
- Other *(Specify)*: ________________ 7 ☐

Go to 13

11. Which category below best describes the type of organization of your principal employment during the week of August 7, 1978? *(Check only ONE category.)*

- Business or industry .... 01 ☐
- Junior college, 2-year college, technical institute .... 02 ☐
- Medical school .... 03 ☐
- Four-year college or university other than medical school .... 04 ☐
- Elementary or secondary school system .... 05 ☐
- Hospital or clinic .... 06 ☐
- U.S. military service, active duty, or Commissioned Corps, e.g., USPHS, NOAA ...... 07 ☐
- U.S. government, civilian employee .... 08 ☐
- State government .... 09 ☐
- Local or other government *(Specify)*: .... 10 ☐ ________________
- International agency .... 11 ☐
- Nonprofit organization, other than hospital, clinic, or educational institution .... 12 ☐
- Other *(Specify)*: ________________ 13 ☐

12. Please give the name of your principal employer (organization, company, etc., or if self-employed, write "self"), and actual place of employment during the week of August 7, 1978.

____
Name of Employer

____
City State

13. What percent of working time did you devote to each of the following activities during the week of August 7, 1978?

	Percent	
Management or administration of research and development	____	01
Management or administration of other than research and development	____	02
Teaching and training -- preparing and teaching courses, guiding and counseling students or trainees	____	03
Basic research	____	04
Applied research	____	05
Development -- product, process, and technical development	____	06
Report and technical writing, editing, information retrieval	____	07
Clinical diagnosis	____	08
Design -- of equipment, processes, models ..	____	09
Quality control, testing, evaluation, or inspection	____	10
Operations -- production, maintenance, construction, installation	____	11
Distribution -- sales, traffic, purchasing, customer and public relations	____	12
Statistical work -- survey work, forecasting, statistical analysis	____	13
Consulting	____	14
Computer applications	____	15
Other activities *(Specify)*: ________________	____	16
Total	100%	

14. Among all the activities marked above, which was your primary and which was your major secondary activity? *(Fill in the appropriate code numbers -- 01 to 16 -- from Q. 13.)*

Primary work activity .... ☐☐

Major secondary work activity ...... ☐☐

15. From the Degree and Employment Specialties List on page 2, select and enter both the number and title of the specialty most closely related to your principal employment during the week of August 7, 1978. Please write in your specialty if it is not on the list.

Number	Type of Specialty

16. What was the basic annual salary* associated with your principal professional employment during the week of August 7, 1978?

$ ______ per year

*NOTE: *Basic annual salary is your annual salary before deductions for income tax, social security, retirement, etc., but does not include bonuses, overtime, summer teaching, or other payment for professional work.*

16a. Were you academically employed?
Yes ... 1 ☐ *Go to 16b and 16c*
No .... 2 ☐ *Go to 17*

16b. Check whether salary was for:
9-10 months ..... 1 ☐
11-12 months .... 2 ☐

16c. What was the title of your position?

Professor .... 1 ☐
Associate professor .... 2 ☐
Assistant professor .... 3 ☐
Instructor .... 4 ☐
Lecturer .... 5 ☐
Teaching assistant .... 6 ☐
Research assistant .... 7 ☐
Other *(Specify)*: ______________________ 8 ☐

17. Was any of your work in the week of August 7, 1978 supported by U.S. government funds?
Yes ... 1 ☐ *Go to 17a*
No .... 2 ☐ *Go to 18*
Don't know.. 3 ☐ *Go to 18*

17a. IF YES to 17, which of the following federal agencies or departments were supporting the work? *(Check all that apply.)*

Agency for International Development .... 01 ☐
Environmental Protection Agency .... 02 ☐
National Aeronautics and Space Administration .... 03 ☐
National Endowment for the Arts .... 04 ☐
National Endowment for the Humanities .... 05 ☐
National Science Foundation .... 06 ☐
Nuclear Regulatory Commission .... 07 ☐
Smithsonian Institution .... 08 ☐
Department of Agriculture .... 09 ☐
Department of Commerce .... 10 ☐
Department of Defense .... 11 ☐
Department of Energy .... 12 ☐
Department of Health, Education, and Welfare:
  National Institutes of Health .... 13 ☐
  Alcohol, Drug Abuse, and Mental Health Administration .... 14 ☐
  National Institutes of Education .... 15 ☐
  Office of Education .... 16 ☐
  Other *(Specify)*: ______________________ 17 ☐
Department of Housing and Urban Development .. 18 ☐
Department of the Interior .... 19 ☐
Department of Justice .... 20 ☐
Department of Labor .... 21 ☐
Department of State .... 22 ☐
Department of Transportation .... 23 ☐
Other agency or department *(Specify)*: .... 24 ☐
Don't know source agency .... 25 ☐

18. Listed below are selected topics of critical national interest. If you devoted a significant proportion of your professional time to any of these problem areas in the week of August 7, 1978, please check the box for the ONE on which you spent the MOST time.

Energy and fuel .... 01 ☐ *Go to 19*
Health .... 02 ☐
Defense .... 03 ☐
Environmental protection, pollution control .... 04 ☐
Education .... 05 ☐
Space .... 06 ☐
Crime prevention and control .... 07 ☐
Food and other agricultural products .... 08 ☐
Natural resources, other than fuel or food .... 09 ☐
Community development and services .. 10 ☐
Housing (planning, design, construction) .... 11 ☐
Transportation, communications ...... 12 ☐
Cultural life .... 13 ☐
Other area *(Specify)*: ______________ 14 ☐
Does not apply .... 88 ☐

Go to 23 (02–88)

APPENDIX C - QUESTIONNAIRE USED IN 1976 NATIONAL SURVEY OF RECENT SCIENCE AND ENGINEERING GRADUATES

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

Dear Graduate:

We need your help in a major national study of the occupational experiences of recent college graduates in Science and Engineering. This project, sponsored by the National Science Foundation will obtain information from a scientifically chosen sample of 16,000 persons who earned Bachelor's or Master's degrees between July 1, 1973 and June 30, 1975. You are one of those chosen to be in this study.

The purpose of this study is to compile national statistics which will allow an appraisal of the employment and educational characteristics of scientists and engineers graduating since 1973. The resulting information will permit the Federal Government, universities and others to formulate science policies and programs and to make evaluations with regard to the science and engineering manpower potential of the nation.

The questionnaire on the following pages will take about 10-15 minutes of your time to complete, and a postage-paid envelope addressed to Westat, Inc. is enclosed for its return. Westat, Inc. has been selected by the National Science Foundation to assist in carrying out this survey.

We wish you to know that your completed questionnaire will be seen only by the immediate research staff and will be used for statistical purposes only. In compliance with the Privacy Act of 1974, no personally identifying information will be released to anyone.

We think you will find it interesting and invite your comments on the questionnaire items. In addition, if you have any questions on the survey or need any assistance in completing the questionnaire, please call (collect) Mr. Mark Waksberg or Mr. George K. Schueller at (301) 881-5310.

It would be of great help if you would complete and return the questionnaire within the next five days. If possible, we suggest that you do it now, while you have it in hand. We believe the importance of the study will justify the time you give to it.

The National Science Foundation would greatly appreciate your cooperation in this survey.

Very truly yours,

Charles E Falk

Charles E. Falk, Director
Division of Science Resources Studies

This information is solicited under the authority of the National Science Foundation Act of 1950, as amended. All information you provide will be treated as confidential and will be used for statistical purposes only. Information will be released only in the form of statistical summaries from which it will be impossible to identify information about any particular person. Your response is entirely voluntary and your failure to provide some or all of the requested information will in no way adversely affect you.

1976 NATIONAL SURVEY OF RECENT SCIENCE AND ENGINEERING GRADUATES
NATIONAL SCIENCE FOUNDATION

DEGREE AND EMPLOYMENT SPECIALTY LIST

Use this list for Questions 5 and 9. Find the number corresponding to the appropriate major field and mark it in the space provided in the questionnaire.

BIOLOGICAL SCIENCE

01 Agriculture, all fields
02 Anatomy and histology
03 Bacteriology
04 Biochemistry
05 Biology (general)
06 Biophysics
07 Botany, horticulture, plant pathology
08 Entomology
09 Forestry, all kinds
10 Genetics
11 Immunology
12 Marine/animal or life science
13 Microbiology
14 Physiology
15 Zoology
16 Other biological science

ENGINEERING

17 Aeronautical, aerospace, astronautical
18 Agricultural
19 Architectural
20 Chemical
21 Civil
22 Electrical or electronic
23 Environmental, sanitary
24 General
25 Industrial
26 Mechanical
27 Metallurgical, material
28 Mining, geol., petro.
29 Nuclear
30 Operations research, systems
31 Technology
32 Other engineering

PHYSICAL SCIENCE MATHEMATICS

33 Astronomy
34 Atmospheric science (meteorology)
35 Chemistry
36 Computer science and data processing
37 Earth science (geology, geophysics)
38 Geography
39 Mathematics
40 Oceanography
41 Physics
42 Statistics
43 Other physical sciences

SOCIAL SCIENCE

44 Anthropology
45 Economics, all fields
46 Linguistics
47 Political science (incl. government, international relations)
48 Public administration
49 Psychology (all fields except clinical)
50 Social work, all fields
51 Sociology
52 Other social science

ARTS AND HUMANITIES

53 Art, fine and applied
54 English (language and literature)
55 Foreign language and literature
56 History
57 Journalism, all fields
58 Music, all fields
59 Philosphy, all fields

BUSINESS

60 Accounting
61 Business Administration (general)
62 Finance
63 Marketing and sales
64 Management, all fields
65 Secretarial studies
66 Other business

EDUCATION

67 Art or music
68 Biological sciences
69 Business
70 Elementary
71 Mathematics
72 Physical education or recreation
73 Physical sciences
74 Secondary
75 Science education, other
76 Special education
77 Other education

PROFESSIONS, TECHNICAL FIELDS

78 Architecture or urban planning
79 Clinical psychology
80 Dentistry
81 Drafting or design, all fields
82 Home economics
83 Health technology (med., dental or lab.)
84 Law or pre-law
85 Library or archival science
86 Medicine or pre-medicine
87 Nursing
88 Pharmacy
89 Religion
90 Other health professions
91 Other

OTHER

92 Building trades
93 Communications (radio, T.V.)
94 Crafts (skilled), all fields
95 Law enforcement
96 Machine operation
97 Military science
98 Other, not elsewhere classified
99 Undecided

OMB No. 99-S76003
Expires: December 1976

1976 SURVEY OF RECENT SCIENCE AND ENGINEERING GRADUATES
NATIONAL SCIENCE FOUNDATION

1. Date of Birth

☐☐☐
Mo. Day Year

2. Citizenship

USA . . . 1 ☐
Non-USA . 2 ☐
(Specify country ____

3. Sex
Male ☐
Female ☐

4. Race/Ethnic Identification:

White/Caucasian . 1 ☐
Black/Negro/or Afro-American . 2 ☐
American-Indian . 3 ☐
Mexican-American/Chicano . . . . 4 ☐
Puerto Rican/American. . . . . 5 ☐
Oriental. . . . . . 6 ☐
Other Asian . . . . 7 ☐
Other (Specify) . . 8 ☐
____

5. List in the table below all undergraduate and graduate degrees, excluding honorary degrees, than have been awarded to you. Please use Specialty List on Page 2 for major field and number.

Type of Degree	Granted		Major Field (Use Specialties List)	
	Month	Year	Name	Number
Bachelor's				
Masters				
Doctorate				

PLEASE NOTE that in items 6-14a, information is requested for the current year as of the week of June 7, 1976.

6. What was your employment status as of the period indicated? (CHECK ONLY ONE CATEGORY.)

Employed full-time, science or engineering related positions . . 1 ☐ Go to 7
Employed full-time, nonscience or nonengineering related position . 2 ☐ Go to 6a
Employed part-time, science or engineering related position. . . 3 ☐ Go to 6b
Employed part-time, nonscience or nonengineering related position . 4 ☐ Go to 6b
Postdoctoral appointment (fellowship, traineeship, research associateship, etc.). . . . . 5 ☐ Go to 7
Unemployed and seeking employment . 6 ☐ Go to 15
Unemployed and not seeking employment. . . . . 7 ☐ Go to 15
Retired and not employed. . . . . . 8 ☐ Go to 15
Other (Specify): ____________ 9 ☐ Go to 15

6a. If you were employed full-time during the week of June 7, 1976, in a position unrelated to science or engineering, what was the MOST important reason for taking the position?

Prefer nonscience or nonengineering position. . . . . 1 ☐
Promoted out of science or engineering position. . . . . . . 2 ☐
Pay is better . . . . 3 ☐
Locational preference . . . . 4 ☐
Go to Q. 7
Science or engineering position not available . . . . 5 ☐
Other (Specify): ____________ 6 ☐

6b. If you were employed part-time during the week of June 7, 1976, were you seeking full-time employment?

Yes . . . 1 ☐ No . . . 2 ☐

7. Which category below best describes the type of organization of your principal employment? (CHECK ONLY ONE CATEGORY.)

Business or Industry . . . . 1 ☐
Junior college, 2-year college, technical institute. . . . . 2 ☐
Medical school . . . . 3 ☐
Four-year college or university other than medical school. . . . . 4 ☐
Elementary or secondary school system. . . 5 ☐
Hospital or clinic . . . . 6 ☐
U.S. military service, active duty, or Commissioned Corps, e.g., USPHS, NOAA . . 7 ☐
U.S. government, civilian employee . . . . 8 ☐
State government . . . . 9 ☐
Local or other government. . . . . .10 ☐
(Specify): ____________
International agency . . . . .11 ☐
Non-profit organization, other than hospital, clinic or educational institution. . . . . .12 ☐
Other (Specify): ____________ 88 ☐

8. What was the primary (A) and secondary (B) work activity related to your position? (CHECK ONLY ONE BOX IN EACH COLUMN.)

		A	B
Management or administration of:			
Research and development.	1	☐	☐
Other than research & development . .	2	☐	☐
Both.	3	☐	☐
Basic research.	4	☐	☐
Applied research.	5	☐	☐
Development of equipment, products, systems data.	6	☐	☐
Design.	7	☐	☐
Teaching.	8	☐	☐
Report or other technical writing, editing	9	☐	☐
Production.	10	☐	☐
Consulting (Specify): ____________	11	☐	☐
Professional services to individuals.	12	☐	☐
Quality control, inspection, testing.	13	☐	☐
Sales, marketing, purchasing, estimating.	14	☐	☐
Other (Specify): ____________	15	☐	☐

9. From the Degree and Employment Specialties List on Page 2, select and enter both the number and title of the specialty most closely related to your principal employment. Write in your specialty if it is not on the list.

____________ ____________
Number Type of Specialty

10. What percent of time did you devote to each of the following activities?

	Percent
Management or administration of:	
Research and development.	____
Other than research and development	____
Basic research.	____
Applied research.	____
Development	____
Design.	____
Teaching.	____
Consulting.	____
Production.	____
Other (Specify): ____________	____
TOTAL	100%

11. Please give the name of your principal employer (organization, company, etc., or, if self-employed write "self"), and actual place of employment.

____
Name of Employer

____
City State Zip Code

12. What was the basic annual salary* associated with your principal professional employment during the week of June 7, 1976 ?

$__________________per year.

*NOTE: Basic annual salary is your annual salary before deductions for income tax, social security, retirement, etc., but does not include bonuses, overtime, summer teaching, or other payment for professional work.

If academically employed:

a. Check whether salary was for 9-10 months ☐ or 11-12 months ☐.

b. What was the title of your position?

Professor 1 ☐
Associate Professor 2 ☐
Assistant Professor 3 ☐
Instructor 4 ☐
Lecturer 5 ☐
Teaching Assistant 6 ☐
Research Assistant 7 ☐
Other (Specify): ____________ 8 ☐
____

Does not apply 9 ☐

13. Listed below are selected topics of critical national interest. If you devoted a significant proportion of your professional time to any of these problem areas in the week of June 7, 1976, please check the box for the one on which you spent the MOST time.

Education:
  Teaching 1 ☐
  Other 2 ☐
Health 3 ☐
Defense 4 ☐
Environmental protection, pollution control 5 ☐
Space 6 ☐
Crime prevention and control 7 ☐
Food production and technology 8 ☐
Energy and fuel 9 ☐
Other mineral resources 10 ☐
Community development and services 11 ☐
Housing (planning, design, construction) 12 ☐
Transportation 13 ☐
Other (Specify): 88 ☐
____
None of the above 14 ☐

14. Was any of your work in the week of June 7, 1976 supported by U.S. Government funds?

Yes 1 ☐ Go to 14a
No 2 ☐ } Go to 15
Don't Know 3 ☐ }

14a. If yes, which of the following Federal agencies or departments were supporting the work? (CHECK ALL THAT APPLY.)

NASA 31 ☐
National Science Foundation 32 ☐
Environmental Protection Agency 33 ☐
Energy Research and Development Administration (AEC) 34 ☐
Nuclear Regulatory Commission 35 ☐
Agency for International Development 36 ☐
Department of Interior 37 ☐
National Institutes of Health, HEW 38 ☐
Alcohol, Drug Abuse and Mental Health Administration, HEW 39 ☐
Office of Education, HEW 40 ☐
Other HEW, (Specify): ____________ 41 ☐
____

Department of Defense 42 ☐
Department of Commerce 43 ☐
Department of Agriculture 44 ☐
Department of Transportation 45 ☐
Department of Justice 46 ☐
Department of Housing and Urban Development 47 ☐
Other agency or department (Specify): 48 ☐
____

Don't know source agency 49 ☐

15. How many years of professional work experience, including teaching, have you had? (Professional experience includes those work activities in which you have been engaged requiring knowledge of your field at the baccalaureate or equivalent background.)

________________ Years

16. Which of the following best describes your current enrollment status? (MARK ONE ONLY.)

Not a student 1 ☐
Graduate student (post baccalaureate):
  Full-time 2 ☐
  Part-time 3 ☐

THANK YOU FOR YOUR COOPERATION. PLEASE RETURN THE COMPLETED QUESTIONNAIRE IN THE ENCLOSED POSTAGE PAID ENVELOPE.

APPENDIX D - QUESTIONNAIRE USED IN THE 1976 NATIONAL SURVEY OF NATURAL AND SOCIAL SCIENTISTS AND ENGINEERS

O.M.B. No. 41-575095; Approval Expires December 31, 1978

Form PMS-26A
(10-20-76)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

1976 NATIONAL SURVEY OF NATURAL AND SOCIAL SCIENTISTS AND ENGINEERS

NOTICE – Your report to the Census Bureau is confidential. It may be seen only by sworn Census employees and may be used only for statistical purposes.

Please read instructions carefully before answering questions.

Answer as accurately as you can by printing your reply clearly or by entering an "X" in the box next to the appropriate reply.

When the instructions for a question direct you to enter a code and description from a list, please refer to the reference list attached to this questionnaire.

A. Is the information shown in the mailing label above correct?

☐ YES

☐ NO – *Please enter the correct information*

Name

Number and street

City or town 810 ☐☐☐ State (if USA) 811 ☐☐☐ ZIP code

Foreign country

B. Is this mailing address the same address as your place of residence?

☐ SAME

☐ DIFFERENT – *Please enter your city and State or foreign country of residence.*

City or town State (if USA) ZIP code

Foreign country

Dear Friend:

Thank you for your continued cooperation in the National Sample of Scientists and Engineers, a series of biennial surveys sponsored by the National Science Foundation and conducted by the Bureau of the Census. From this series, a comprehensive picture of the development and utilization of America's scientists and engineers is being obtained. And, since the surveys include a sample of persons from various other fields, in addition to science and engineering, a valuable measure of the employment and skills among the highly educated population in general has been gained. Statistical data from these surveys are used for planning and analysis by Federal and State manpower agencies, private businesses, nonprofit research organizations, industrial and trade associations, and universities. Your cooperation, of course, has been an essential element in the success of this program.

To extend the value of past surveys, the National Science Foundation has asked the Bureau to survey this sample of persons once again to collect current employment information and related data. This is the most reliable and least costly way to learn, for example, how the employment of highly trained persons is affected by fluctuations in the economy. For the survey to be successful and yield truly representative information, it is important that each person fill out and return the questionnaire.

Please complete the questions which follow on pages 2 through 4 and return your questionnaire in the enclosed preaddressed envelope. For some questions you are instructed to enter a code and description from Reference List A, B, or C. These lists are attached to the questionnaire.

This information is being collected under the authority of the National Science Foundation Act of 1950, as amended. The information you provide is confidential and may be seen only by sworn employees of the Bureau of the Census. The information cannot be used for anything but statistical purposes and cannot be given to any other Government agency, private concern, or individual. The data will be released only in the form of statistical summaries from which it will be impossible to identify information about any particular person. Your response is entirely voluntary and your failure to provide some or all of the requested information will in no way adversely affect you.

Thank you for your cooperation.

Sincerely,

Vincent P Barabba

VINCENT P. BARABBA
Director
Bureau of the Census

Enclosure

PART I – EDUCATION AND TRAINING

1. EDUCATION FROM 1972 TO THE PRESENT

a. Since January 1972 have you attended any college, university, or other post high school institution?

1 ☐ Yes – *Continue with 1b* 2 ☐ No – *Skip to question 2*

b. List below each institution from which you have obtained (since January 1972) or are currently obtaining formal training beyond the high school level, and give the other information requested. Begin with the most recent and work back through January 1972. Use a separate row for each degree granted or worked for. Designate degrees by abbreviation (e.g., A.A., B.A., M.A., Ph.D., LL.B., M.D., etc.).

	College, university, or other post high school institution *(Enter Name and State or foreign country)*	Type of degree worked for, if any *(Enter Ph.D., M.A., B.A., A.A., etc. or mark "None" box)*	Major field of study *(Enter code and description from Reference List A)*	Your degree was awarded or will be awarded. *(Enter year or mark "None" box)*
MOST RECENT	013 ☐☐☐ Name ____ State or foreign country ____	014 ____ OR x ☐ None	015 ☐☐☐ ← Code Description ____ ____	016 19____ OR x ☐ None
2ND TO LAST	017 ☐☐☐ Name ____ State or foreign country ____	018 ____ OR x ☐ None	019 ☐☐☐ ← Code Description ____ ____	020 19____ OR x ☐ None
3RD TO LAST	021 ☐☐☐ Name ____ State or foreign country ____	022 ____ OR x ☐ None	023 ☐☐☐ ← Code Description ____ ____	024 19____ OR x ☐ None

2. OTHER TRAINING RECEIVED IN 1974 OR 1975

Aside from formal education, which of the following types of training did you receive in 1974 or 1975?

Mark the appropriate year for each type of training you have received.

	025 1974	026 1975
1. On-the-job training	1 ☐	1 ☐
2. Military training applicable to civilian occupations	2 ☐	2 ☐
3. Extension or correspondence courses	3 ☐	3 ☐
4. Courses at employer's training facility	4 ☐	4 ☐
5. Courses at adult education center	5 ☐	5 ☐
6. Other training	6 ☐	6 ☐
7. None	7 ☐	7 ☐

PART II – EMPLOYMENT STATUS

PLEASE NOTE that in items 3a–5 information is requested for both the current year, as of the week of February 8–14, 1976, and last year, as of the week of February 9–15, 1975. Please answer applicable questions in column (A), then in column (B).

	Week of February 8–14, 1976 (A)	Week of February 9–15, 1975 (B)
3a. What was your employment status as of the week indicated?	027 1 ☐ Employed full time – *Skip to 4a* 2 ☐ Employed part time – *Answer 3b* 3 ☐ On post doctoral appointment (fellowship, traineeship, research associate, etc.) – *Skip to 4a* 4 ☐ Unemployed and seeking work – *Go to column (B)* 5 ☐ Not employed and not seeking work – *Skip to 5*	028 1 ☐ Employed full time – *Skip to 4a* 2 ☐ Employed part time – *Answer 3b* 3 ☐ On post doctoral appointment (fellowship, traineeship, research associate, etc.) – *Skip to 4a* 4 ☐ Unemployed and seeking work – *Go to Part III* 5 ☐ Not employed and not seeking work – *Skip to 5*
b. If you worked part time, were you seeking full-time work?	029 1 ☐ Yes 2 ☐ No } *Continue with 4a*	030 1 ☐ Yes 2 ☐ No } *Continue with 4a*
4a. Were you working in a position related to science or engineering?	031 1 ☐ Yes – *Go to top of column (B)* 2 ☐ No – *Answer 4b*	032 1 ☐ Yes – *Go to Part III* 2 ☐ No – *Answer 4b*
b. What was the most important reason for taking this position?	033 *MARK ONLY ONE BOX* 1 ☐ Preferred nonscience or nonengineering position 2 ☐ Promoted out of science or engineering position 3 ☐ Pay was better in nonscience or nonengineering position 4 ☐ Locational preference 5 ☐ Science or engineering position not available 6 ☐ Other – *Specify* ____ *(Go to top of column B)*	034 *MARK ONLY ONE BOX* 1 ☐ Preferred nonscience or nonengineering position 2 ☐ Promoted out of science or engineering position 3 ☐ Pay was better in nonscience or nonengineering position 4 ☐ Locational preference 5 ☐ Science or engineering position not available 6 ☐ Other – *Specify* ____ *(Go to Part III)*
5. If you were not employed and not seeking work, were you principally	035 *MARK ONLY ONE BOX* 1 ☐ Retired 2 ☐ Other – *Specify* ____ *(Go to top of column B)*	036 *MARK ONLY ONE BOX* 1 ☐ Retired 2 ☐ Other – *Specify* ____ *(Go to Part III)*

PART III – JOB ACTIVITIES

INSTRUCTIONS FOR COMPLETING QUESTIONS 6–16b

a. Complete column (A) for questions 6–16b for the job held during the week of February 8–14, 1976 or for your most recent prior job held.

b. Column (B) should be completed only if the job you had during the week of February 9–15, 1975 differed from the job described in column (A). If the job was the same, mark the "YES" box at the top of column (B). NOTE: Consider a change of jobs to have occurred if (1) you changed employers; or (2) you remained with the same employer but there were significant changes in duties, levels of responsibility, or occupation; or (3) you worked at a different institution while on sabbatical leave from a college or university.

c. If you held more than one job during the weeks mentioned above, please report only the job at which you worked the greatest number of hours.

	Job held during week of February 8–14, 1976 or most recent prior job (A)	Job held during week of February 9–15, 1975 Was this the same job as entered in column (A)? 037 1 ☐ Yes – *Do not complete column (B)* 2 ☐ No – *Complete column (B)* (B)
6. Where did you work? *Write in city and State or foreign country of company, business, agency, or other employer.*	038 ☐☐☐ City ____ 040 ☐☐☐ State or foreign country ____	039 ☐☐☐ City ____ 041 ☐☐☐ State or foreign country ____

FORM PMS-29A (10-29-75)

PART III – JOB ACTIVITIES – Continued

	Job held during week of February 8–14, 1976 or most recent prior job (A)	Job held during week of February 9–15, 1975 (B)
7. What kind of business was this? *Enter code and description from Reference List B.*	042 ☐☐☐ ← CODE Description ______	043 ☐☐☐ ← CODE Description ______
8. What was your occupation? *Enter code and description from Reference List C.*	044 ☐☐☐ ← CODE Description ______	045 ☐☐☐ ← CODE Description ______
9. What work activities were related to this position? *Mark all activities in which you spent time.*	046 1 ☐ Management or administration of research and development 2 ☐ Management or administration of other than research and development 3 ☐ Teaching and training – preparing and teaching courses, guiding and counseling students or trainees 4 ☐ Basic research 5 ☐ Applied research 6 ☐ Development – product, process, and technical development 048 7 ☐ Report and technical writing, editing, information retrieval 8 ☐ Clinical diagnosis 9 ☐ Design – of equipment, processes, models 10 ☐ Quality control, testing, evaluation, or inspection 050 11 ☐ Operations – production, maintenance, construction, installation 12 ☐ Distribution – sales, traffic, purchasing, customer and public relations 13 ☐ Statistical work – survey work, forecasting, statistical analysis 052 14 ☐ Consulting 15 ☐ Computer applications 16 ☐ Other activities – *Specify* ↴ ______	047 1 ☐ Management or administration of research and development 2 ☐ Management or administration of other than research and development 3 ☐ Teaching and training – preparing and teaching courses, guiding and counseling students or trainees 4 ☐ Basic research 5 ☐ Applied research 6 ☐ Development – product, process, and technical development 049 7 ☐ Report and technical writing, editing, information retrieval 8 ☐ Clinical diagnosis 9 ☐ Design – of equipment, processes, models 10 ☐ Quality control, testing, evaluation, or inspection 051 11 ☐ Operations – production, maintenance, construction, installation 12 ☐ Distribution – sales, traffic, purchasing, customer and public relations 13 ☐ Statistical work – survey work, forecasting, statistical analysis 053 14 ☐ Consulting 15 ☐ Computer applications 16 ☐ Other activities – *Specify* ↴ ______
10. Among all the activities marked above which was your primary and which was your major secondary activity? *Fill in the appropriate code numbers (1 to 16) from question 9.*	CODE 054 ______ Primary 056 ______ Secondary	CODE 055 ______ Primary 057 ______ Secondary
11. What percent of working time did you devote to each of the following activities? ***PLEASE NOTE*** **Basic research** is study directed toward gaining scientific knowledge primarily for its own sake. **Applied research** is study directed toward gaining scientific knowledge in an effort to meet a recognized need. **Development** is direction of the knowledge gained from research toward production of useful materials, devices, systems, and methods. ***Entries in each column should sum to 100%***	058 ______% Management or administration of research and development 060 ______% Management or administration of other than research and development 062 ______% Basic research 064 ______% Applied research 066 ______% Development 068 ______% Design 070 ______% Teaching 072 ______% Consulting 074 ______% Other – *Specify* ______ 100% TOTAL	059 ______% Management or administration of research and development 061 ______% Management or administration of other than research and development 063 ______% Basic research 065 ______% Applied research 067 ______% Development 069 ______% Design 071 ______% Teaching 073 ______% Consulting 075 ______% Other – *Specify* ______ 100% TOTAL
12. Which category best describes the type of organization of your principal employment or post doctoral appointment?	076 *MARK ONLY ONE BOX* 01 ☐ Business or industry 02 ☐ Junior college, 2-year college, technical institute 03 ☐ Medical school 04 ☐ 4-year college or university, other than medical school 05 ☐ Elementary or secondary school system 06 ☐ Hospital or clinic 07 ☐ Non-profit organization, other than hospital, clinic, or educational institution 08 ☐ U.S. military service, active duty, or Commissioned Corps, e.g., USPHS, NOAA 09 ☐ U.S. Government, civilian employee 10 ☐ State government 11 ☐ Local or other government – *Specify* ↴ ______ 12 ☐ International agency 13 ☐ Self-employed 14 ☐ Other – *Specify* ______	077 *MARK ONLY ONE BOX* 01 ☐ Business or industry 02 ☐ Junior college, 2-year college, technical institute 03 ☐ Medical school 04 ☐ 4-year college or university, other than medical school 05 ☐ Elementary or secondary school system 06 ☐ Hospital or clinic 07 ☐ Non-profit organization, other than hospital, clinic, or educational institution 08 ☐ U.S. military service, active duty, or Commissioned Corps, e.g., USPHS, NOAA 09 ☐ U.S. Government, civilian employee 10 ☐ State government 11 ☐ Local or other government – *Specify* ↴ ______ 12 ☐ International agency 13 ☐ Self-employed 14 ☐ Other – *Specify* ______

Continue on Page 4

PART III – JOB ACTIVITIES – Continued

	Job held during week of February 8–14, 1976 or most recent prior job (A)	Job held during week of February 9–15, 1975 (B)
13. Between what dates did you hold this position? *Enter month and year*	078 From 079 To OR Present ☐	080 From 081 To
14. What was the basic salary associated with this position? If you were on a post doctoral appointment, include stipend plus allowances. (Basic salary refers to salary before deductions for income tax, social security, retirement, etc. but does not include bonuses, overtime, summer teaching, or other payment for secondary jobs.)	082 $ __________ .00 084 1 ☐ Per year 2 ☐ Per month 3 ☐ Per week **If academically employed, mark whether salary is for –** 086 1 ☐ 9–10 months 2 ☐ 11–12 months	083 $ __________ .00 085 1 ☐ Per year 2 ☐ Per month 3 ☐ Per week **If academically employed, mark whether salary is for –** 087 1 ☐ 9–10 months 2 ☐ 11–12 months
15. During the previous year (1975 for Column A, 1974 for Column B), what was the basic salary associated with this position?	088 1 ☐ Did not hold this job in 1975 – *Skip to 16a* 090 $ __________ .00 in 1975 092 1 ☐ Per year 2 ☐ Per month 3 ☐ Per week **If academically employed, mark whether salary is for –** 094 1 ☐ 9–10 months 2 ☐ 11–12 months	089 1 ☐ Did not hold this job in 1974 – *Skip to 16a* 091 $ __________ .00 in 1974 093 1 ☐ Per year 2 ☐ Per month 3 ☐ Per week **If academically employed, mark whether salary is for –** 095 1 ☐ 9–10 months 2 ☐ 11–12 months
16a. Was ANY of your work supported or sponsored by U.S. Government funds?	096 1 ☐ Yes – *Continue with 16b* 2 ☐ No . . . . . } *Skip to 17a* 3 ☐ Don't know } *Skip to 17a*	097 1 ☐ Yes – *Continue with 16b* 2 ☐ No . . . . . } *Skip to 17a* 3 ☐ Don't know } *Skip to 17a*
b. Which of the following agencies or departments were supporting the work? *Mark as many as apply*	098 1 ☐ Department of Housing and Urban Development 2 ☐ Department of the Interior 3 ☐ Department of Labor 4 ☐ Department of Defense 5 ☐ Department of Commerce 6 ☐ Department of Agriculture 100 7 ☐ Department of Transportation 8 ☐ Department of Justice Department of Health, Education, and Welfare 9 ☐ NIH (National Institutes of Health) 10 ☐ Alcohol and Drug Abuse Mental Health Administration 102 11 ☐ Office of Education 12 ☐ Other H.E.W. – *Specify* __________ 13 ☐ NASA (National Aeronautic and Space Administration) 104 14 ☐ NSF (National Science Foundation) 15 ☐ EPA (Environmental Protection Agency) 16 ☐ ERDA (Energy Research and Development Administration) 106 17 ☐ Nuclear Regulatory Commission 18 ☐ AID (Agency for International Development) 19 ☐ Other agency or department – *Specify* __________ 108 20 ☐ Don't know source agency	099 1 ☐ Department of Housing and Urban Development 2 ☐ Department of the Interior 3 ☐ Department of Labor 4 ☐ Department of Defense 5 ☐ Department of Commerce 6 ☐ Department of Agriculture 101 7 ☐ Department of Transportation 8 ☐ Department of Justice Department of Health, Education, and Welfare 9 ☐ NIH (National Institutes of Health) 10 ☐ Alcohol and Drug Abuse Mental Health Administration 103 11 ☐ Office of Education 12 ☐ Other H.E.W. – *Specify* __________ 13 ☐ NASA (National Aeronautic and Space Administration) 105 14 ☐ NSF (National Science Foundation) 15 ☐ EPA (Environmental Protection Agency) 16 ☐ ERDA (Energy Research and Development Administration) 107 17 ☐ Nuclear Regulatory Commission 18 ☐ AID (Agency for International Development) 19 ☐ Other agency or department – *Specify* __________ 109 20 ☐ Don't know source agency

PART IV – OTHER INFORMATION

17a. At anytime during calendar year 1975 were you without a job AND actively seeking employment?	110 1 ☐ Yes – *Continue with 17b* 2 ☐ No – *Skip to question 18*
b. For how many weeks were you seeking employment?	111 1 ☐ 1 to 4 weeks 2 ☐ 5 to 10 weeks 3 ☐ 11 to 14 weeks 4 ☐ 15 to 26 weeks 5 ☐ 27 weeks or more
18. How many years of professional experience, including teaching, have you had? *Enter number of years*	112 __________ Years
19. Based on your total education and experience, what do you regard yourself as professionally? *Enter code and description from Reference List C.*	113 ☐☐☐ ← CODE Description __________
20. Listed at the right are selected topics of critical national interest. If you devote a significant proportion of your professional time to any of these problem areas, please mark the box for the one on which you spend the MOST time.	114 *MARK ONLY ONE BOX* 01 ☐ Health Education 02 ☐ Teaching 03 ☐ Other 04 ☐ Environment protection, pollution control 05 ☐ Space 06 ☐ National defense 07 ☐ Crime prevention and control 08 ☐ Food production and technology 09 ☐ Energy and fuel 10 ☐ Other mineral resources 11 ☐ Community development and services 12 ☐ Housing (planning, design, construction) 13 ☐ Does not apply

21. In the event that it is necessary to contact you to clarify some of the information you provided, may we contact you by telephone?

Yes – *Enter number(s) on which you can be reached* →
No

Area code	Telephone number	Area code	Telephone number

22. Please enter the name of a person at an address other than yours through whom you can be reached.

Name	Address *Number and street*	City	State or foreign country	ZIP code

23. Print your name here

Date prepared

REFERENCE LIST A – MAJOR FIELDS OF STUDY

This list is to be used in answering question 1b about the field(s) in which you have obtained study or training. It is divided into two sections: Section I is a list of fields of academic study generally leading to bachelor's or higher degrees; Section II is a list of fields of study and training below those generally leading to a bachelor's degree.

Please scan the entire list, choose the appropriate answer for the question and then enter the code and description in the appropriate section of question 1b. If none of the categories listed below adequately describes what you were studying or being trained in, use the "Other" category (code 600 or 625) and enter a brief description of what you were studying in the space provided on the questionnaire.

PLEASE DETACH BEFORE RETURNING YOUR COMPLETED QUESTIONNAIRE

Section I – FIELDS OF ACADEMIC STUDY LEADING TO BACHELOR'S OR HIGHER DEGREES

Code	Description
	Biological and Agricultural Sciences and Related Fields
501	Agriculture, business
502	Agriculture, general
503	Agronomy, field crops
504	Anatomy and histology
505	Animal physiology
506	Animal science
507	Bacteriology, virology, mycology, parasitology
508	Biochemistry
509	Biology, general
510	Biophysics
511	Botany, general
512	Dairy science (dairy husbandry)
513	Entomology
514	Farm management
515	Fish and game or wildlife management
516	Food science (food technology and processing, dairy manufacturing and technology, food industry)
517	Forestry
518	Genetics
519	Horticulture
520	Immunology
521	Microbiology
522	Plant pathology
523	Plant physiology
524	Soil science (soil management, soil conservation)
525	Zoology, general
526	Biological and agricultural sciences, other fields
	Education
527	Biological sciences education
528	Mathematics education
529	Physical sciences education
530	Trade and industrial training
531	Education, other fields
	Engineering
532	Aerospace, aeronautical, astronautical, and related fields
533	Agricultural
534	Architectural
535	Chemical, petroleum refining
536	Civil, construction, transportation
537	Electrical, electronics
538	Engineering sciences, mechanics, physics
539	Engineering technology
540	Environmental/sanitary engineering
541	General or unified
542	Industrial
543	Mechanical
544	Metallurgical, materials, ceramics
545	Mining, mineral, geological
546	Naval architecture and marine engineering
547	Nuclear
548	Operations research/systems engineering
549	Petroleum
550	Engineering, other fields
	Health Fields
551	Medicine or premedicine, and clinical medical sciences
552	Nursing (4 year or longer program)
553	Pathology
554	Pharmacology
555	Pharmacy
556	Health professions, other fields (4 year or longer program)

Code	Description
	Mathematical Sciences
557	Mathematics
558	Statistics and actuarial sciences
559	Computer sciences and systems analysis
560	Operations research/management science
	Physical Sciences
560	Astronomy
561	Chemistry
593	Geography
563	Meteorology
564	Physics
565	Physical sciences, general
566	Geology and geophysics
567	Oceanography
568	Physical sciences, other fields
	Psychology
569	Clinical
570	Educational
571	General psychology
572	Psychology, other fields
	Social Sciences
573	Anthropology
574	Area studies, regional studies
575	Economics, agricultural
576	Economics, except agricultural
577	Foreign service programs
593	Geography
579	History
580	Industrial relations
581	International relations
582	Political science or government
583	Public administration
584	Social sciences, general
585	Social work, social administration, social welfare
586	Sociology
587	Social sciences, other fields
	Arts, Humanities, and Other Specialties
588	Arts, general
589	Business and commerce, including accounting, hotel and restaurant administration, and secretarial studies
590	English and journalism
591	Fine and applied arts, all fields
592	Foreign language and literature, all fields
593	Geography
594	Home economics, all fields
595	Law or prelaw
596	Library science
597	Military science, including merchant marine deck officer
598	Philosophy, all fields
599	Religion and theology, all fields
600	Other *(Describe briefly under the applicable item on the questionnaire.)*

Section II – FIELDS OF ACADEMIC STUDY AND OCCUPATIONAL TRAINING RELATED TO PROGRAMS BELOW THE BACCALAUREATE

Code	Description
	Data Processing-related fields of study or training
601	Computer programming
602	Computer operating
603	All other data processing fields of study or training
	Engineering-related fields of study or training
604	Drafting and design, all fields
605	Aeronautical technology
606	Architectural or building technology
607	Chemical technology
608	Civil technology
609	Electrical and electronics technology
610	Industrial technology
611	Mechanical technology
612	All other engineering-related fields of study or training
	Science-related fields of study or training
613	Agriculture
614	Forestry
615	Other science-related fields of study or training

Code	Description
	Other fields of study or training
616	Business and commerce-related fields of study or training
617	Craft (skilled) occupations-related fields of study or training (such as carpentry, bricklaying, tool and die making, etc.)
618	Educational-related fields of study or training
619	Home economics
620	Nursing and other health service-related fields of study or training
621	Operative occupations-related fields of study or training (such as machine operation, driving, inspecting, etc.)
622	Police technology or law enforcement
623	Sales and marketing-related fields of study or training
624	Service occupations-related fields of study or training (such as cook, beautician, firefighter, etc.)
625	All other fields of study or training *(Describe briefly under the applicable item on the questionnaire.)*

REFERENCE LIST B – KINDS OF BUSINESSES

This list is to be used in answering question 7 about the kind(s) of business or industry for which you worked. Please scan the entire list, choose the appropriate answer for the question and enter the code and description from this list. If none of the categories listed below adequately describes the kind of business for which you worked, use the "Other" category (code 731).

Code	Description
	Manufacturing
701	Aircraft, aircraft engines, aircraft parts
702	Chemicals and allied products
703	Electrical machinery, equipment and supplies for the generation, storage, transformation, transmission, and utilization of electrical energy
704	Electronic apparatus, radio, television and communication equipment and parts
705	Electronic computers, accounting, calculating and office machinery and equipment
706	Fabricated metal products (except ordnance, machinery and transportation equipment)
707	Machinery (except electrical) including engines and turbines, farming and construction machinery, mining, metalworking and other manufacturing and service industry machines
708	Motor vehicles and motor vehicle equipment including trucks, buses, automobiles, railroad engines and cars
709	Ordnance, including manufacture of arms, ammunition, tanks, and complete guided missiles, space vehicles and equipment
710	Petroleum refining and related industries
711	Primary metal industries, including smelting, refining, rolling, drawing, alloying, and manufacture of castings, forgings and other basic metal products
712	Professional and scientific equipment and supplies
713	Other manufacturing including printing and publishing
	Educational Institutions
714	College or university (offering at least a bachelor's degree)
715	Junior college or technical institute
716	Medical school
717	Other educational institutions
	Health Services
718	Hospital or clinic
719	Other medical and health services

Code	Description
	Other Kinds of Business
720	Agriculture, forestry, and fisheries
721	Business, personal, and professional services
722	Construction
723	Engineering or architectural services
724	Finance, insurance, or real estate
725	Mining and petroleum extraction
726	Private, nonprofit organizations other than educational institutions and hospitals
727	Professional and technical societies
728	Research institutions
729	Retail and wholesale trade
730	Transportation, communication, or other public utilities
731	Other *(Describe briefly under the applicable item on the questionnaire.)*

Public Administration (Include only uniquely governmental activities, such as the U.S. Postal Service, U.S. Air Force, State court, Department of Motor Vehicles, city building inspection, or city public welfare. For example, if you work for the U.S. Postal Service use code 733, Federal public administration; on the other hand, if you work at a Veterans' Administration Hospital, use code 718, Hospital or clinic; if you work at a State university, use code 714, College or university; if you work for a county road building agency, use code 722, Construction; if you work in a Defense Department research laboratory, use code 728, Research institution.)

Code	Description
732	Uniformed military service
733	Federal public administration
734	State public administration
735	Local public administration (city, county, etc.)
737	Regional government
736	Other government

REFERENCE LIST C – OCCUPATIONS

This list is to be used in answering questions 8 and 19 about your occupational classification. Please scan the entire list, choose the appropriate entry and enter the code and description from this list. If you cannot find exactly the right entry, please choose the one that comes nearest to it. If none of the entries is at all appropriate, use the "Other" category (code 475) and enter a brief description in the space provided on the questionnaire.

Code	Description
	Engineers, including college professors and instructors
401	Engineer, aeronautical and astronautical
402	Engineer, agricultural
403	Engineer, chemical
404	Engineer, civil and architectural
405	Engineer, electrical and electronic
406	Engineer, industrial
407	Engineer, mechanical
408	Engineer, metallurgical and materials
409	Engineer, mining, petroleum, and geological
410	Engineer, nuclear
411	Engineer, environmental and sanitary
412	Engineer, operations research systems
413	Engineer, other fields *(Describe briefly under the applicable item on the questionnaire.)*
	Computer Specialist, including college professors and instructors
414	Computer programmer
415	Computer systems analyst
416	Computer scientist
417	Other computer specialist *(Describe briefly under the applicable item on the questionnaire.)*
	Mathematicians and Statisticians, including college professors and instructors
418	Actuary
419	Mathematician
420	Statistician
421	Operations research analyst
	Physical Scientists, including college professors and instructors
422	Chemist
423	Earth scientists including geologists, geophysicists, etc.
424	Physicist, astronomer
425	Atmospheric scientist, meteorologist
426	Oceanographer
427	Other physical scientist *(Describe)*
	Biological Scientists, including college professors and instructors
428	Agricultural scientists, including foresters and conservationists
429	Biological scientist
430	Biochemist
431	Biophysicist
432	Medical scientist, excluding persons who are primarily medical practitioners; see Health Occupations
433	Other biological scientist *(Describe)*
	Social scientists, including college professors and instructors
434	Economist
435	Psychologist
436	Sociologist or anthropologist
437	Other social scientist *(Describe briefly under the applicable item on the questionnaire.)*

Code	Description
	Health Occupations, including persons who are primarily practitioners. Persons engaged primarily in medical research, teaching, and similar activities use code 432, Medical scientist.
438	Physician or surgeon
439	Technician, dental
440	Technician, medical
441	Other health occupation *(Describe briefly under the applicable item on the questionnaire.)*
	Technicians and Technologists, except medical
442	Designer, electronic parts and machine tools
443	Designer, industrial
444	Designer, other
445	Draftsman
446	Surveyor
447	Technician, biological and agricultural
448	Technician, electrical and electronic
449	Technician, construction, highways, and architectural
450	Technician, mechanical
451	Technician, other engineering
452	Technician, physical science
453	Technician, other fields *(Describe briefly under the applicable item on the questionnaire.)*
	Teachers
454	Teacher, elementary school
455	Teacher, secondary school
456	Teacher, college and university, **excluding engineering and science** *(Engineering and science teachers see codes 401–437 above.)*
	Administrators, Managers, and Officials, excluding farm
476	Urban and regional planner
457	College president or dean
458	Administrator or manager, scientific and technical research and development
459	Administrator or manager, production and operations
460	Administrator, manager, or official, all other, excluding self-employed
461	Self-employed proprietor
	All Other Occupations
462	Accountant
463	Attorney or judge
464	Sales worker
465	Clerical worker (such as bookkeeper, secretary, etc.)
466	Clergy
467	Craft worker (such as baker, carpenter, electrician, mechanic, repair worker)
468	Farmer (owner, manager, tenant, or farm laborer)
469	Fire fighter or police
470	Laborer, except farm
471	Librarian
472	Merchant or shopkeeper, self-employed
473	Operative (such as assembler, factory worker, miner, welder, truck driver, etc.)
474	Postal worker
475	Other occupations, not specified above *(Describe briefly under the applicable item on the questionnaire.)*